



Installation Instructions

CONTENTS

	Page
SAFETY CONSIDERATIONS	1
INSTALLATION	3
Storage Recommendations	3
• PROVIDE MACHINE PROTECTION	
• EVAPORATOR PROTECTION	
• INSPECTION DURING STORAGE	
Step 1 — Place and Rig the Unit	3
• PLACING UNIT	
• RIGGING	
• MOUNTING UNIT	
Step 2 — Check Compressor Mounting	16
Step 3 — Connect Evaporator Fluid and Drain Piping	16
• ALL UNITS	
• VICTAULIC COUPLING INSTALLATION	
• UNITS WITH FACTORY-INSTALLED HYDRONIC PACKAGES	
• AIR SEPARATION	
• UNITS WITH OPTIONAL PARTIAL HEAT RECOVERY	
Step 4 — Fill the Chilled Water Loop	31
• WATER SYSTEM CLEANING	
• FILLING THE SYSTEM	
• PUMP VFD	
• SENSORLESS CONTROL (CLOSED LOOP) — ACTIVE SETUP 1	
• REMOTE SENSOR (CLOSED LOOP) — ACTIVE SETUP 2	
• REMOTE CONTROLLER (OPEN LOOP) — ACTIVE SETUP 3	
• PREPARATION FOR YEAR-ROUND OPERATION	
• FREEZE PROTECTION	
• PREPARATION FOR WINTER SHUTDOWN	
Step 5 — Make Electrical Connections	43
• POWER SUPPLY	
• POWER WIRING	
• CONTROL POWER	
Step 6 — Install Accessories	56
• ELECTRICAL	
Step 7 — Check Refrigerant Circuit	56
• DETECTION OF FLAMMABLE REFRIGERANTS	
• REMOVAL AND EVACUATION	
• CHARGING PROCEDURES	
• RECOVERY	
• CARRIER COMFORT NETWORK® (CCN) COMMUNICATION BUS WIRING	
• BACNET IP, MSTP OR ETHERNET COMMUNICATION	
• NON-CCN COMMUNICATION WIRING	
• MS/TP WIRING RECOMMENDATIONS	
APPENDIX A — UNIT PRESSURE DROP CURVES	60

SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location.

Only trained, qualified installers and service mechanics should install, start up, and service this equipment.

Untrained personnel can perform basic maintenance functions, such as cleaning coils. All other operations should be performed by trained service personnel. Qualified installers and service technicians are required to have been trained on the following topics when installing and servicing air-conditioning equipment with A2L refrigerant such as R-32:

1. Explosive potential of A2L refrigerants
2. Potential ignition sources
3. Safety measures for unventilated and ventilated rooms or enclosures
4. Refrigerant detectors
5. Concept of sealed components and sealed enclosures according to IEC 60079-15:2010
6. Correct work procedures for the following:
 - a. Commissioning
 - b. Maintenance
 - c. Repair
 - d. Decommissioning
 - e. Disposal

Refer to Controls and Troubleshooting Guide for complete guidelines. When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.

1. Follow all safety codes.
2. Keep quenching cloth and fire extinguisher nearby when brazing.
3. Wear safety glasses and work gloves.
4. Use care in handling, rigging, and setting bulky equipment.

It is important to recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

NOTE: Take notice of the following symbols, which are required for A2L refrigerants and can be found on the unit:

SYMBOL	CODE	MEANING
	IEC 60417-5032 (2002-10)	Alternating current
	IEC 60417-5019 (2006-8)	Protective earth
	IEC 60417-5018 (2006-10)	Functional earthing
	ISO 7000-0434A (2004-01)	Caution
	ISO 7000-0790 (2004-01)	Read operator's manual
	IEC 60417-5036 (2002-10)	Dangerous voltage
	GHS02: Flammable	Flammable gas
	ISO 7010-W021 (2011-05)	Warning: flammable materials
	ISO 7000-1659 (2004-01)	Service indicator: read technical manual
	ISO 7000-1701 (2004-01)	Pressure
	ISO 7000-1641 (2004-01)	Operator's manual: operating instructions

⚠ WARNING

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

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

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

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

⚠ CAUTION

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

⚠ WARNING

DO NOT use means to accelerate the defrosting process, or to clean, other than those recommended by the manufacturer.

If unit is to be stored, it shall be stored in an area or room without continuously operating open flames (for example, an operating gas appliance) or other potential ignition sources, such as operating electric heaters or hot surfaces.

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

⚠ CAUTION

This system uses an A2L refrigerant (R-32) which have higher pressures than R-22 and other refrigerants. No other refrigerant can be used in this system. Failure to use gauge set, hoses, and recovery systems designed to handle refrigerant R-32 may result in equipment damage or personal injury. Refer to section "Check Refrigerant Circuit" on page 56 for guidelines on proper A2L refrigerant handling and equipment used for A2L refrigerant. If unsure about equipment, consult the equipment manufacturer.

INSTALLATION

Storage Recommendations

The 30RC air-cooled chillers are designed for outdoor installations. At times, a delay in construction or other factors require that a unit be stored for a period of time prior to installation. The following guidelines should be used for unit storage.

PROVIDE MACHINE PROTECTION

Place and store the unit in an area that will protect it from vandalism, accidental contact with vehicles, falling debris or construction waste. Ideally, do not remove the shipping protection such as the coil protectors. This will provide additional protection for the unit. The unit should be stored outdoors. Unit must not be stored or installed within 20 ft of any opening to a building.

EVAPORATOR PROTECTION

It is important to treat the evaporator and associated piping and pumps to prevent corrosion and/or freezing. The unit should be shipped with a small amount of an inhibited glycol solution to treat any residual water remaining in the heat exchanger. Carrier recommends one of the following steps be taken to ensure no corrosion occurs:

1. Install blank-off Victualic^{TM1} plates on the chilled water connections. Completely fill the chilled water piping with an appropriate inhibited glycol solution to protect the chilled water piping circuit to 15°F (8.3°C) below the lowest anticipated ambient temperature. This is the preferred method if the circuit includes a pump package.
2. Be sure to completely remove any water in the evaporator before storing. Blow out evaporator to remove any liquid before storing. Consider installing blank-off VictualicTM plates on the chilled water connections. Evacuate and pressurize the chilled water circuit with nitrogen to slightly above atmospheric pressure, 15 psig. If pressurization is used, be sure to note that the chilled water circuit is under pressure and should be treated as if it is under pressure. Any service or installation work should proceed with proper Lock Out-Tag Out procedures.

INSPECTION DURING STORAGE

To ensure faster installation when the time comes, the following inspection schedule is recommended:

Every 3 Months

The 30RC units are shipped with a complete operating charge of R-32. Check each refrigerant circuit to be sure that there is positive pressure, at least 26 psig (180 kPa) in the circuit. If a circuit is found to be without pressure, contact a qualified refrigeration mechanic. The system should be pressurized to find the leak. It should be repaired, dehydrated, and recharged with refrigerant. If a positive circuit pressure was not found, the compressor oil should be changed or at least sampled to determine if moisture is present. If moisture is found in the compressor oil, the oil should be changed.

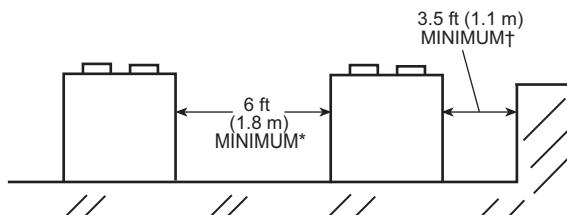
Every 6 Months

Check the unit for damage, both physical and from wildlife. Check the unit for nests from rodents, birds, or insects. Depending on location, these organisms can cause deterioration of components which may result in failure. Consider an exterminator if necessary. If damage is found and it will interfere with the installation, consider repairing the damage before installation. Check the unit control box for signs of moisture. If moisture is found, determine the entry path and seal the leak.

Step 1 — Place and Rig the Unit

PLACING UNIT

Units are suitable for outdoor use only. For 30RC010-060 units, see Fig. 1. When parallel chillers are aligned such that coils face each other, a minimum of 6 ft (1829 mm) separation is recommended. When the parallel arrangement has only one coil drawing air from the space between chillers, a minimum of 3.5 ft (1067 mm) is recommended. When parallel chillers have no coils facing each other (a back-to-back arrangement), be sure to maintain the larger of the recommended service clearances associated with each chiller (see the certified drawings). Due to NEC (National Electric Code) regulations, a minimum clearance of 4 ft (1219 mm) must be maintained on the side of the chiller that has an electrical box. Chiller fan discharge must be at least as high as adjacent solid walls. Installation in pits is not recommended.



* Minimum for when coils face each other. Less clearance is required in other configurations.

† Clearance of 3.5 ft is required when a coil faces the wall. When there is no coil facing the wall, see the certified drawing for the required service clearance.

Fig. 1 — 30RC010-060 Multiple Unit Separation

These instructions cover installation of 30RC010-060 air-cooled liquid chillers. Refer to Fig. 2 for model number to determine factory-installed options.

RIGGING

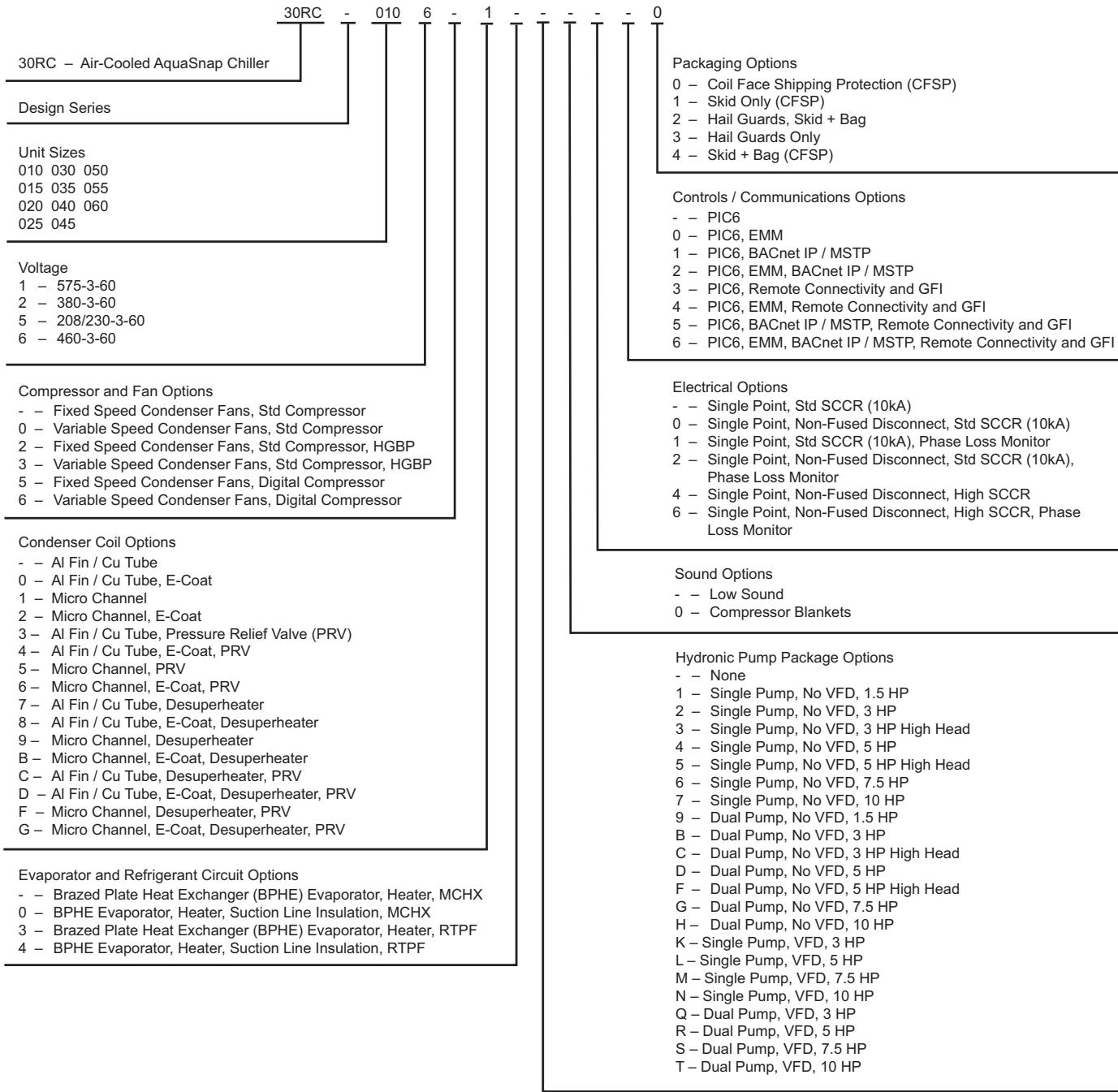
Preferred method for rigging is with spreader bars from above the unit. Use shackles in lifting holes. Rig at a single point with 4 cables for size 010-060 units or use spread bars. All panels must be in place when rigging. See rigging label on unit for details concerning shipping weights, distance between lifting holes, center of gravity, and lifting ring dimensions. See Tables 1-6 and Fig. 3 and 4 for unit weights. See Tables 7-10 for physical data. See Fig. 4 for rigging label.

If overhead rigging is not possible, place chiller on skid or pad for rolling or dragging. When rolling, use a minimum of 3 rollers. When dragging, pull the pad. *Do not apply force to the unit.* When in final position, raise from above to lift unit off pad.

CAUTION

All panels must be in place when rigging. If they are not, damage to unit could result.

1. Third-party trademarks and logos are the property of their respective owners.



LEGEND

EMM	— Energy Management Module
GFI	— Ground Fault Interrupting
MCHX	— Microchannel Heat Exchanger
SCCR	— Short Circuit Current Rating
VFD	— Variable Frequency Drive

Quality Assurance

ISO 9001: 2015-certified processes



Fig. 2 – AquaSnap® Chiller Model Number Designation 30RC010-060

Table 1 — MCHX Coil, No Pump Units

30RC SIZE	POUNDS				
	A	B	C	D	Total Weight
010	299	230	177	230	937
015	320	239	180	242	981
020	420	306	243	334	1305
025	457	337	276	373	1445
030	467	347	283	381	1478
035	696	779	441	394	2309
040	752	745	417	421	2335
045	729	819	459	409	2417
050	789	780	432	436	2438
055	799	818	469	458	2543
060	831	849	488	478	2646

30RC SIZE	KILOGRAMS				
	A	B	C	D	Total Weight
010	136	104	80	104	425
015	145	108	82	110	445
020	191	139	110	151	592
025	207	153	125	169	655
030	212	157	129	173	670
035	316	353	200	179	1047
040	341	338	189	191	1059
045	331	371	208	186	1096
050	358	354	196	198	1106
055	362	371	213	208	1153
060	377	385	221	217	1200

Table 2 — MCHX Coil, Single Pump Units

30RC SIZE	POUNDS				
	A	B	C	D	Total Weight
010	314	296	238	252	1100
015	335	305	240	264	1144
020	447	361	294	365	1468
025	484	392	327	404	1608
030	495	400	334	413	1641
035	732	913	560	449	2653
040	787	881	534	477	2679
045	765	953	579	464	2761
050	823	916	550	493	2781
055	833	953	587	514	2887
060	835	953	588	516	2890

30RC SIZE	KILOGRAMS				
	A	B	C	D	Total Weight
010	142	134	108	114	499
015	152	138	109	120	519
020	203	164	134	165	666
025	220	178	148	183	729
030	224	181	151	187	744
035	332	414	254	204	1203
040	357	400	242	216	1215
045	347	432	262	210	1252
050	373	415	249	224	1261
055	378	432	266	233	1310
060	378	432	267	234	1311

Table 3 — MCHX Coil, Dual Pump Units

30RC SIZE	POUNDS				
	A	B	C	D	Total Weight
010	331	362	297	272	1262
015	352	372	298	283	1306
020	474	416	345	393	1630
025	510	447	379	433	1770
030	522	454	386	442	1803
035	772	1044	679	501	2996
040	824	1014	653	531	3022
045	803	1085	699	518	3104
050	859	1050	668	548	3125
055	871	1086	707	568	3230
060	872	1085	708	569	3233

30RC SIZE	KILOGRAMS				
	A	B	C	D	Total Weight
010	150	164	135	123	572
015	160	169	135	128	592
020	215	189	157	178	739
025	232	203	172	196	803
030	237	206	175	200	818
035	350	473	308	227	1359
040	374	460	296	241	1371
045	364	492	317	235	1408
050	390	476	303	248	1417
055	395	492	321	257	1465
060	396	492	321	258	1466

Table 4 — AL/CU Coil, No Pump Units

30RC SIZE	POUNDS				
	A	B	C	D	Total Weight
010	296	233	206	262	997
015	318	242	207	274	1041
020	422	307	273	375	1377
025	457	338	315	1377	1535
030	467	346	321	433	1567
035	739	828	468	418	2454
040	799	792	443	447	2480
045	783	880	493	439	2596
050	847	837	464	468	2616
055	855	875	502	490	2722
060	887	907	521	510	2825

30RC SIZE	KILOGRAMS				
	A	B	C	D	Total Weight
010	134	106	94	119	452
015	144	110	94	124	472
020	191	139	124	170	624
025	207	153	143	193	696
030	212	157	146	196	711
035	335	376	212	190	1113
040	363	359	201	203	1125
045	355	399	224	199	1177
050	384	380	212	1187	1187
055	388	397	228	222	1235
060	402	411	236	231	1281

Table 5 — AL/CU Coil, Single Pump Units

30RC SIZE	POUNDS				
	A	B	C	D	Total Weight
010	312	299	269	280	1159
015	333	309	271	292	1203
020	448	362	325	403	1540
025	485	393	367	453	1697
030	495	400	373	462	1730
035	772	962	590	473	2798
040	829	928	563	503	2824
045	815	1015	617	494	2939
050	876	975	585	525	2960
055	885	1012	623	545	3066
060	915	1044	644	565	3169

30RC SIZE	KILOGRAMS				
	A	B	C	D	Total Weight
010	142	136	122	127	526
015	151	140	123	132	546
020	203	164	148	183	698
025	220	178	166	206	769
030	224	181	169	210	785
035	350	436	268	214	1269
040	376	421	255	228	1281
045	369	460	280	224	1333
050	397	442	265	238	1343
055	402	459	283	247	1391
060	415	474	292	256	1437

Table 6 — AL/CU Coil, Dual Pump Units

30RC SIZE	POUNDS				
	A	B	C	D	Total Weight
010	330	363	331	300	1322
015	351	372	332	311	1366
020	475	417	378	432	1702
025	512	448	420	480	1860
030	522	455	426	490	1892
035	809	1099	711	523	3141
040	864	1065	683	554	3167
045	849	1148	739	547	3283
050	908	1110	708	579	3304
055	919	1146	746	599	3409
060	948	1178	768	618	3512

30RC SIZE	KILOGRAMS				
	A	B	C	D	Total Weight
010	150	165	150	136	600
015	159	169	151	141	620
020	215	189	171	196	772
025	232	203	190	218	843
030	237	206	193	222	858
035	367	499	323	237	1425
040	392	483	310	251	1436
045	385	520	335	248	1489
050	412	503	321	262	1499
055	417	520	338	271	1546
060	430	534	348	280	1593

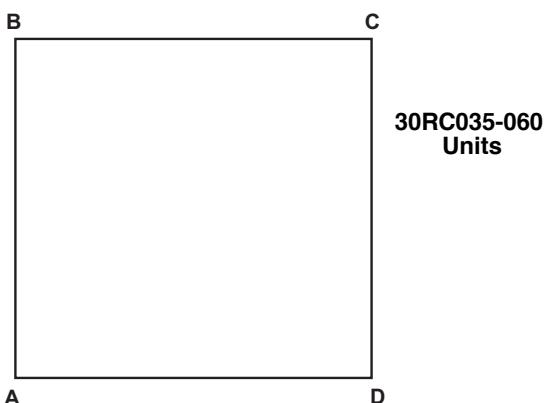
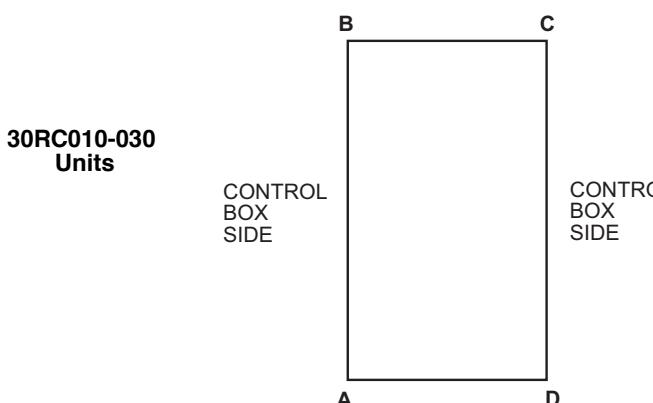


Fig. 3 — Unit Mounting Points

Table 7 — Physical Data, 30RC 010-025 — English^a

UNIT 30RC	010	015	020	025
CHASSIS DIMENSIONS (in.)				
Length	44	44	44	44
Width ^b	67	67	89	89
Height	67	67	67	79
SHIPPING WEIGHT (lb)				
MCHX Condenser, No Pump	914	955	1271	1400
MCHX Condenser, Single Pump	1077	1117	1434	1563
MCHX Condenser, Dual Pump	1239	1280	1596	1597
Al-Cu Condenser, No Pump	974	1015	1343	1490
Al-Cu Condenser, Single Pump	1136	1177	1506	1652
Al-Cu Condenser, Dual Pump	1299	1340	1668	1815
OPERATING WEIGHT (lb)				
MCHX Condenser, No Pump	937	981	1305	1445
MCHX Condenser, Single Pump	1100	1144	1468	1608
MCHX Condenser, Dual Pump	1262	1306	1630	1770
Al-Cu Condenser, No Pump	997	1041	1377	1535
Al-Cu Condenser, Single Pump	1159	1203	1540	1697
Al-Cu Condenser, Dual Pump	1322	1366	1702	1860
REFRIGERANT TYPE	R-32, EXV Controlled System			
Total Refrigerant Charge MCHX (lb)	7.50	8.00	10.50	12.75
Refrigerant Charge MCHX (lb) Ckt A/Ckt B	7.50/—	8.00/—	10.50/—	12.75/—
Total Refrigerant Charge RTPF (lb)	15.50	16.50	21.75	26.50
Refrigerant Charge RTPF (lb) Ckt A/Ckt B	15.50/—	16.50/—	21.75/—	26.50/—
COMPRESSORS	Scroll, Hermetic			
Quantity	2	2	2	2
Speed (rpm)	3500			
Capacity (tons), Ckt A	10	15	20	26
No. Capacity Steps				
Standard	3	3	2	2
With Hot Gas Bypass	—	—	3	3
Digital Compressor Option	21	21	22	22
Minimum Capacity Step (%)				
Standard	40	40	50	50
With Hot Gas Bypass	—	—	24	29
Digital Compressor Option	20	20	17	17
Capacity (%)				
Circuit A	100	100	100	100
Circuit B	—	—	—	—
EVAPORATOR	Brazed, Direct-Expansion Plate Heat Exchanger			
Weight (lb) (empty)	32	38	49	62
Net Fluid Volume (gal)	1.20	1.56	2.28	3.72
Maximum Refrigerant Pressure (psig)	710			
Maximum Water-Side Pressure				
Without Pump (psig)	300			
With Pump (psig)	150			
CHILLED WATER CONNECTIONS (in.)				
Inlet and Outlet, Victaulic (IPS Carbon Steel) ^c	2	2	2	2
Drain (NPT)	0.25			

Table 7 — Physical Data, 30RC 010-025 — English^a (cont)

UNIT 30RC	010	015	020	025
CONDENSER FANS	Axial Vertical Discharge, Composite			
Fan Speed (rpm)	850			
No. Blades...Diameter (in.)	9...30			
No. Fans	1	1	2	2
Total Airflow (cfm)	9,900	9,800	21,000	21,500
CONDENSER COILS	Novation MCHX Aluminum Tube, Aluminum Fin (Optional Round Tube Plate Fin)			
Quantity (Ckt A/Ckt B)	1/-	1/-	1/-	1/-
Total Face Area (sq ft)	19	19	26	33
Maximum Refrigerant Pressure (psig)	650			
HYDRONIC MODULE (Optional)	Pump(s), Strainer with Blowdown Valve, Expansion Tank, Pressure Taps, Drain and Vent Plugs, Flow Switch and Balance Valve			
Pump	Single or Dual, Centrifugal Monocell Pump(s), 3500 RPM, Dual Pumps with Check and Isolation Valves			
Expansion Tank Volume (gal) Total/Acceptance	4.4/3.2	4.4/3.2	4.4/3.2	4.4/3.2

NOTE(S):

- a. Flow switch and strainer are standard on all units, with or without hydronic package.
- b. The width shown here includes a 4 inch overhang for the control panel. The footprint width is 4 inches less than the indicated value.
- c. Unit connection is IPS Carbon Steel piping.

Table 8 — Physical Data, 30RC 030-060 — English^a

UNIT 30RC	030	035	040	045	050	055	060
CHASSIS DIMENSIONS (in.)							
Length	44	89	89	89	89	89	89
Width ^b	89	96	96	96	96	96	96
Height	79	67	67	79	79	79	79
SHIPPING WEIGHT (lb)							
MCHX Condenser, No Pump	1434	2237	2255	2337	2356	2458	2561
MCHX Condenser, Single Pump	1597	2581	2599	2681	2699	2802	2805
MCHX Condenser, Dual Pump	1759	2924	2942	3024	3043	3145	3148
Al-Cu Condenser, No Pump	1523	2382	2400	2516	2534	2637	2740
Al-Cu Condenser, Single Pump	1686	2726	2744	2859	2878	2981	3084
Al-Cu Condenser, Dual Pump	1848	3069	3087	3203	3203	3222	3427
OPERATING WEIGHT (lb)							
MCHX Condenser, No Pump	1478	2309	2335	2417	2438	2543	2646
MCHX Condenser, Single Pump	1641	2653	2679	2761	2781	2887	2890
MCHX Condenser, Dual Pump	1803	2996	3022	3104	3125	3230	3233
Al-Cu Condenser, No Pump	1567	2454	2480	2596	2616	2722	2825
Al-Cu Condenser, Single Pump	1730	2798	2824	2939	2960	3066	3169
Al-Cu Condenser, Dual Pump	1892	3141	3167	3283	3304	3409	3512
REFRIGERANT TYPE							
						R-32, EXV Controlled System	
Total Refrigerant Charge MCHX (lb)	14.00	25.00	26.00	27.00	27.50	28.00	28.00
Refrigerant Charge MCHX (lb) Ckt A/Ckt B	14.00/—	12.50/12.50	13.00/13.00	13.50/13.50	13.75/13.75	14.00/14.00	14.00/14.00
Total Refrigerant Charge RTPF (lb)	29.00	52.00	54.00	56.00	57.00	58.00	58.00
Refrigerant Charge RTPF (lb) Ckt A/Ckt B	29.00/—	26.00/26.00	27.00/27.00	28.00/28.00	28.50/28.50	29.00/29.00	29.00/29.00
COMPRESSORS						Scroll, Hermetic	
Quantity	2	4	4	4	4	4	4
Speed (rpm)						3500	
Capacity (tons), Ckt A	30	20	22	22	26	26	30
No. Capacity Steps							
Standard	2	4	4	4	4	4	4
With Hot Gas Bypass	3	5	5	5	5	5	5
Digital Compressor Option	22	44	44	44	44	44	44
Minimum Capacity Step (%)							
Standard	50	23	24	25	23	23	25
With Hot Gas Bypass	32	9	11	12	14	13	16
Digital Compressor Option	20	9	8	8	8	8	8
Capacity (%)							
Circuit A	100	54	47	47	50	46	50
Circuit B	—	46	53	53	50	54	50
EVAPORATOR						Brazed, Direct-Expansion Plate Heat Exchanger	
Weight (lb) (empty)	62	88	114	114	122	133	133
Net Fluid Volume (gal)	3.72	6.24	7.19	7.19	7.43	7.79	7.79
Maximum Refrigerant Pressure (psig)					710		
Maximum Water-Side Pressure							
Without Pump (psig)					300		
With Pump (psig)					150		
CHILLED WATER CONNECTIONS (in.)							
Inlet and Outlet, Victaulic (IPS Carbon Steel) ^c	2	2.5	2.5	2.5	2.5	2.5	2.5
Drain (NPT)					0.25		

Table 8 — Physical Data, 30RC 030-060 — English^a (cont)

UNIT 30RC	030	035	040	045	050	055	060
CONDENSER FANS	Axial Vertical Discharge, Composite						
Fan Speed (rpm)	850						
No. Blades...Diameter (in.)	9...30						
No. Fans	2	3	3	3	3	4	4
Total Airflow (cfm)	21,400	32,600	32,500	33,300	33,200	44,600	44,500
CONDENSER COILS	Novation MCHX Aluminum Tube, Aluminum Fin (Optional Round Tube Plate Fin)						
Quantity (Ckt A/Ckt B)	1/-	1/1	1/1	1/1	1/1	1/1	1/1
Total Face Area (sq ft)	33	53	53	66	66	66	66
Maximum Refrigerant Pressure (psig)	650						
HYDRONIC MODULE (Optional)	Pump(s), Strainer with Blowdown Valve, Expansion Tank, Pressure Taps, Drain and Vent Plugs, Flow Switch and Balance Valve						
Pump	Single or Dual, Centrifugal Monocell Pump(s), 3500 RPM, Dual Pumps with Check and Isolation Valves						
Expansion Tank Volume (gal) Total/Acceptance	4.4/3.2	10.3/10.3	10.3/10.3	10.3/10.3	10.3/10.3	10.3/10.3	10.3/10.3

NOTE(S):

- a. Flow switch and strainer are standard on all units, with or without hydronic package.
- b. The width shown here includes a 4 inch overhang for the control panel. The footprint width is 4 inches less than the indicated value.
- c. Unit connection is IPS Carbon Steel piping.

Table 9 — Physical Data, 30RC 010-025 — SI^a

UNIT 30RC	010	015	020	025
CHASSIS DIMENSIONS (mm)				
Length	1117	1117	1117	1117
Width ^b	1701	1701	2260	2260
Height	1701	1701	1701	2006
SHIPPING WEIGHT (kg)				
MCHX Condenser, No Pump	415	433	577	635
MCHX Condenser, Single Pump	489	507	650	709
MCHX Condenser, Dual Pump	562	581	724	782
Al-Cu Condenser, No Pump	442	460	609	676
Al-Cu Condenser, Single Pump	515	534	683	749
Al-Cu Condenser, Dual Pump	589	608	757	823
OPERATING WEIGHT (kg)				
MCHX Condenser, No Pump	425	445	592	655
MCHX Condenser, Single Pump	499	519	666	729
MCHX Condenser, Dual Pump	572	592	739	803
Al-Cu Condenser, No Pump	452	472	624	696
Al-Cu Condenser, Single Pump	526	546	698	769
Al-Cu Condenser, Dual Pump	600	620	772	843
REFRIGERANT TYPE	R-32, EXV Controlled System			
Total Refrigerant Charge MCHX (kg)	3.4	3.63	4.42	5.78
Refrigerant Charge MCHX (kg) Ckt A/Ckt B	3.4/-	3.63/-	4.42/-	5.78/-
Total Refrigerant Charge RTPF (kg)	8	7	8.6	11
Refrigerant Charge RTPF (kg) Ckt A/Ckt B	8/-	7/-	8.6/-	11/-
COMPRESSORS	Scroll, Hermetic			
Quantity	2	2	2	2
Speed (R/s)		58.3		
Capacity (kw), Ckt A	35	53	70	91
Oil Charge (L) Ckt A/Ckt B	—	—	—	—
No. Capacity Steps				
Standard	3	3	2	2
With Hot Gas Bypass	3	3	2	2
Digital Compressor Option	—	—	3	3
Minimum Capacity Step (%)				
Standard	40	40	50	50
With Hot Gas Bypass	—	—	24	29
Digital Compressor Option	20	20	17	17
Capacity (%)				
Circuit A	100	100	100	100
Circuit B	—	—	—	—
EVAPORATOR	Brazed, Direct-Expansion Plate Heat Exchanger			
Weight (kg) (empty)	15	17	22	28
Net Fluid Volume (L)	4.54	5.91	8.63	14.08
Maximum Refrigerant Pressure (kPa)		1172		
Maximum Water-Side Pressure				
Without Pump(s) (kPa)		2068		
With Pump (kPa)		1034		
CHILLED WATER CONNECTIONS (in.)				
Inlet and Outlet, Victaulic (IPS Carbon Steel) ^c	2	2	2	2
Drain (NPT)		0.25		

Table 9 — Physical Data, 30RC 010-025 — SI^a (cont)

UNIT 30RC	010	015	020	025
CONDENSER FANS	Axial Vertical Discharge, Composite			
Fan Speed (rpm)	850			
No. Blades...Diameter (mm)	9...762			
No. Fans	1	1	2	2
Total Airflow (cu m/s)	4.68	1.63	9.92	10.14
CONDENSER COILS	Novation MCHX Aluminum Tube, Aluminum Fin (Optional Round Tube Plate Fin)			
Quantity (Ckt A/Ckt B)	1/-	1/-	1/-	1/-
Total Face Area (sq m)	1.76	1.76	2.41	3.06
Maximum Refrigerant Pressure (kPa)	4481			
HYDRONIC MODULE (Optional)	Pump(s), Strainer with Blowdown Valve, Expansion Tank, Pressure Taps, Drain and Vent Plugs, Flow Switch and Balance Valve			
Pump	Single or Dual, Centrifugal Monocell Pump(s), 3500 RPM, Dual Pumps with Check and Isolation Valves			
Expansion Tank Volume (L) Total/Acceptance	16.7/12.11	16.7/12.11	16.7/12.11	16.7/12.11

NOTE(S):

- a. Flow switch and strainer are standard on all units, with or without hydronic package.
- b. The width shown here includes a 102 mm overhang for the control panel. The footprint width is 102 mm less than the indicated value.
- c. Unit connection is IPS Carbon Steel piping.

Table 10 — Physical Data, 30RC 030-060 — SI^a

UNIT 30RC	030	035	040	045	050	055	060
CHASSIS DIMENSIONS (mm)							
Length	1117	2260	2260	2260	2260	2260	2260
Width ^b	2260	2438	2438	2438	2438	2438	2438
Height	2006	1701	1701	2006	2006	2006	2006
SHIPPING WEIGHT (kg)							
MCHX Condenser, No Pump	650	1015	1023	1060	1069	1115	1162
MCHX Condenser, Single Pump	724	1171	1179	1216	1224	1271	1272
MCHX Condenser, Dual Pump	798	798	1334	1372	1372	1427	1428
Al-Cu Condenser, No Pump	691	691	1089	1141	1149	1196	1243
Al-Cu Condenser, Single Pump	765	765	1245	1297	1305	1352	1399
Al-Cu Condenser, Dual Pump	838	838	1453	1453	1461	1508	1554
OPERATING WEIGHT (kg)							
MCHX Condenser, No Pump	670	1047	1059	1096	1106	1153	1200
MCHX Condenser, Single Pump	744	1203	1215	1261	1261	1310	1311
MCHX Condenser, Dual Pump	818	1359	1371	1408	1417	1465	1466
Al-Cu Condenser, No Pump	711	1113	1125	1177	1187	1235	1281
Al-Cu Condenser, Single Pump	785	1269	1281	1333	1343	1391	1437
Al-Cu Condenser, Dual Pump	858	1425	1436	1489	1499	1546	1593
REFRIGERANT TYPE							
R-32, EXV Controlled System							
Total Refrigerant Charge MCHX (kg)	6.12	8.85	8.96	11.11	11.57	11.91	12.25
Refrigerant Charge MCHX (kg) Ckt A/Ckt B	6.12/-	4.42/4.42	4.54/4.42	5.33/-	5.78/5.78	5.78/6.12	6.12/6.12
Total Refrigerant Charge RTPF (kg)	12	17	17.5	21.8	22.7	23.4	24
Refrigerant Charge RTPF (kg) Ckt A/Ckt B	12/-	8.62/8.62	12.2/12.2	10.43/11.34	11.34/11.34	11.34/11.97	11.97/11.97
COMPRESSORS							
Scroll, Hermetic							
Quantity	2	4	4	4	4	4	4
Speed (R/s)				58.3			
Capacity (kw), Ckt A	106	70	77	77	91	91	106
Oil Charge (L) Ckt A/Ckt B	—	10	11	15	15	17	17
No. Capacity Steps							
Standard	2	4	4	4	4	4	4
With Hot Gas Bypass	3	5	5	5	5	5	5
Digital Compressor Option	22	44	44	44	44	44	44
Minimum Capacity Step (%)							
Standard	50	23	24	25	23	23	25
With Hot Gas Bypass	32	9	11	12	14	13	16
Digital Compressor Option	20	9	8	8	8	8	8
Capacity (%)							
Circuit A	100	54	47	47	50	46	50
Circuit B	—	46	53	53	50	54	50
EVAPORATOR							
Brazed, Direct-Expansion Plate Heat Exchanger							
Weight (kg) (empty)	28	40	52	52	55	60	60
Net Fluid Volume (L)	14.08	23.06	27.22	27.22	28.13	29.49	29.49
Maximum Refrigerant Pressure (kPa)				1172			
Maximum Water-Side Pressure							
Without Pump(s) (kPa)				2068			
With Pump (kPa)				1034			
CHILLED WATER CONNECTIONS (in.)							
Inlet and Outlet, Victaulic (IPS Carbon Steel) ^c	2	2.5	2.5	2.5	2.5	2.5	2.5
Drain (NPT)				0.25			

Table 10 – Physical Data, 30RC 030-060 – SI^a (cont)

UNIT 30RC	030	035	040	045	050	055	060
CONDENSER FANS	Axial Vertical Discharge, Composite						
Fan Speed (rpm)	850						
No. Blades...Diameter (mm)	9...762						
No. Fans	2	3	3	3	3	4	4
Total Airflow (cu m/hr)	10.09	15.39	15.32	15.70	15.66	21.03	20.98
CONDENSER COILS	Novation MCHX Aluminum Tube, Aluminum Fin (Optional Round Tube Plate Fin)						
Quantity (Ckt A/Ckt B)	1/-	1/1	1/1	1/1	1/1	1/1	1/1
Total Face Area (sq m)	3	5	5	6	6	6	6
Maximum Refrigerant Pressure (kPa)	4481						
HYDRONIC MODULE (Optional)	Pump(s), Strainer with Blowdown Valve, Expansion Tank, Pressure Taps, Drain and Vent Plugs, Flow Switch and Balance Valve						
Pump	Single or Dual, Centrifugal Monocell Pump(s), 3500 RPM, Dual Pumps with Check and Isolation Valves						
Expansion Tank Volume (L) Total/Acceptance	38.9/38.9	38.9/38.9	38.9/38.9	38.9/38.9	38.9/38.9	38.9/38.9	38.9/38.9

NOTE(S):

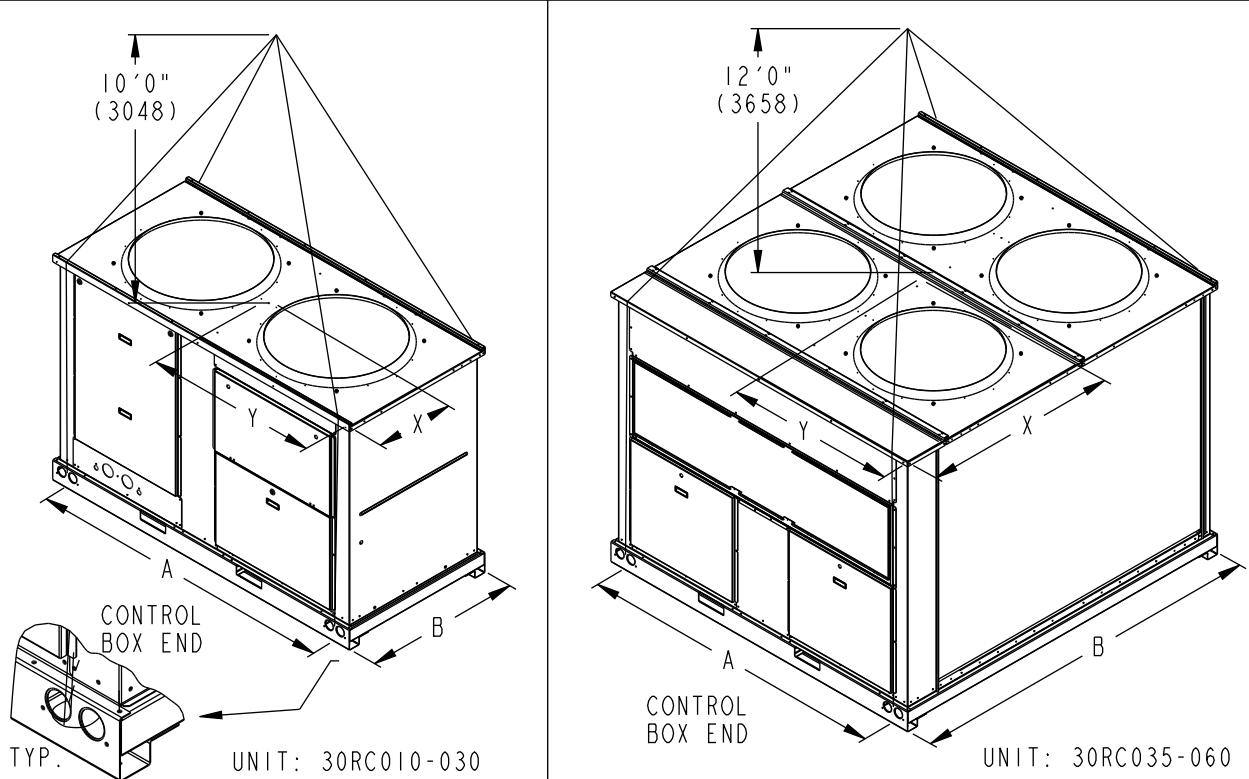
- a. Flow switch and strainer are standard on all units, with or without hydronic package.
- b. The width shown here includes a 102 mm overhang for the control panel. The footprint width is 102 mm less than the indicated value.
- c. Unit connection is IPS Carbon Steel piping.

CAUTION - NOTICE TO RIGGERS:

ALL PANELS MUST BE IN PLACE WHEN RIGGING. FORK ONLY THROUGH BASE RAIL FORK OPENINGS.

NOTES:

1. RIG WITH FOUR CABLES USING A MINIMUM 20 FT. (6096mm) LENGTH FOR 010-030 SIZES AND 24 FT. (7315mm) LENGTH FOR 035-060 SIZES.
2. CENTRAL LIFTING POINT MUST BE A MINIMUM OF 10 FT. (3048mm) FOR 010-030 SIZES AND 12 FT. (3658mm) FOR 035-060 SIZES ABOVE THE TOP OF THE UNIT.
3. LIFTING HOLES PROVIDED ARE 2.25 IN. (57.2mm) DIAMETER.
4. CHECK BILL OF LADING FOR SHIPPING WEIGHT OF UNIT.
5. 010-030 SIZES SUBTRACT 230 LBS (104 KGS) FROM THE MAX WEIGHT FOR UNITS WITHOUT PUMPS. 035-060 SIZES SUBTRACT 290 LBS (132 KGS) FROM THE MAX WEIGHT FOR UNITS WITHOUT PUMPS.



MODEL NUMBER	MCHX				RTPF(CU/AL)				LIFTING HOLES				CENTER OF GRAVITY			
	MAX. SHIP WT. W/O PACKAGING		MAX. SHIP WT. W/PACKAGING		MAX. SHIP WT. W/O PACKAGING		MAX. SHIP WT. W/PACKAGING		A		B		X		Y	
	LBS	KGS	LBS	KGS	LBS	KGS	LBS	KGS	IN	MM	IN	MM	IN	MM	IN	MM
30RC010	1087	493	1165	528	1228	557	1306	593	57.4	1458	40.3	1022	19.4	493	34.8	884
30RC015	1125	510	1203	546	1266	574	1344	609	57.4	1458	40.3	1022	19.1	485	34.3	871
30RC020	1458	661	1544	700	1670	758	1756	797	79.4	2017	40.3	1022	19.3	490	38.8	985
30RC025	1567	711	1653	750	1833	831	1919	870	79.4	2017	40.3	1022	19.6	498	38.9	989
30RC030	1608	729	1694	768	1873	850	1959	889	79.4	2017	40.3	1022	19.6	498	39.0	990
30RC035	2850	1293	3055	1386	3275	1485	3480	1578	79.4	2017	92.1	2340	36.5	926	46.1	1171
30RC040	2872	1303	3077	1396	3297	1495	3502	1588	79.4	2017	92.1	2340	36.2	921	44.0	1118
30RC045	2925	1327	3130	1420	3456	1568	3661	1661	79.4	2017	92.1	2340	36.2	921	46.2	1172
30RC050	2950	1338	3155	1431	3481	1579	3686	1672	79.4	2017	92.1	2340	36.0	914	44.0	1118
30RC055	3056	1386	3261	1479	3587	1627	3792	1720	79.4	2017	92.1	2340	36.5	927	44.6	1133
30RC060	3062	1389	3267	1482	3593	1630	3798	1723	79.4	2017	92.1	2340	36.5	927	44.6	1132

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Fig. 4 — Unit Rigging Label Detail

MOUNTING UNIT

When unit is in proper location, use of mounting holes in base rails is recommended for securing unit to supporting structure, or for mounting unit on vibration isolators if required. See Fig. 5-11. Fasteners for mounting unit are field supplied. Be sure unit is level to within 1/8 in. (.32 mm) per foot for proper oil return to compressor. Assure unit is mounted more than 20 ft from any opening to the building.

Step 2 — Check Compressor Mounting

As shipped, units with single compressors are held down with 4 bolts through rubber grommets. All units with tandem compressors are held down with 6 bolts per pair through grommets. After unit is installed, verify mounting bolt torque 7 to 10 ft-lb (9.5 to 13.6 N·m).

Step 3 — Connect Evaporator Fluid and Drain Piping

ALL UNITS

These chillers are supplied with factory-installed strainer (including blow-down valve) in the entering fluid piping and flow switch in the leaving fluid piping. Flow switch wiring is factory installed.

⚠ CAUTION

Do not circulate water through unit without strainer in place. Failure to use the strainer represents abuse and may impair or otherwise negatively affect the Carrier product warranty.

Piping connections are located on the front of the chiller when facing the control panel for sizes 010-030 and at the end opposite the control panel for sizes 035-060. See Fig. 5-8, depending on model. See Fig. 9-11 for accessory storage tank dimensions and Fig. 12 for thermistor details.

All sizes have carbon steel Victaulic IPS connections as shown in the physical data tables. Any connecting pipe to the 30RC unit must be of a material that will not cause any galvanic corrosion. For this reason, dissimilar metals must not be used unless joined by a dielectric coupling.

Provide a means of venting air from the high point of the field-installed piping as required. Install field-supplied drains in both the entering and leaving fluid connections.

⚠ CAUTION

An automatic air/refrigerant separator and pressure relief valve must be installed in the secondary circuit (water side) on the outlet of the chiller. In the event of an evaporator leak, this will limit the amount of R-32 refrigerant released to the building.

After field piping is complete, freeze-up protection is recommended using inhibited glycol or other suitable inhibited antifreeze solution. Antifreeze is the only way to assure protection from an ambient freeze condition. If antifreeze is not used, provide electric heat tapes in areas where piping is exposed to low ambient temperatures (34°F [1°C] or below). Heat tapes should possess a rating for area ambient temperatures and be covered with a suitable thickness of closed-cell insulation. Route power for heating tapes from a separately fused disconnect. Identify disconnect as heat tape power source with a warning that power must not be turned off except when unit is being serviced.

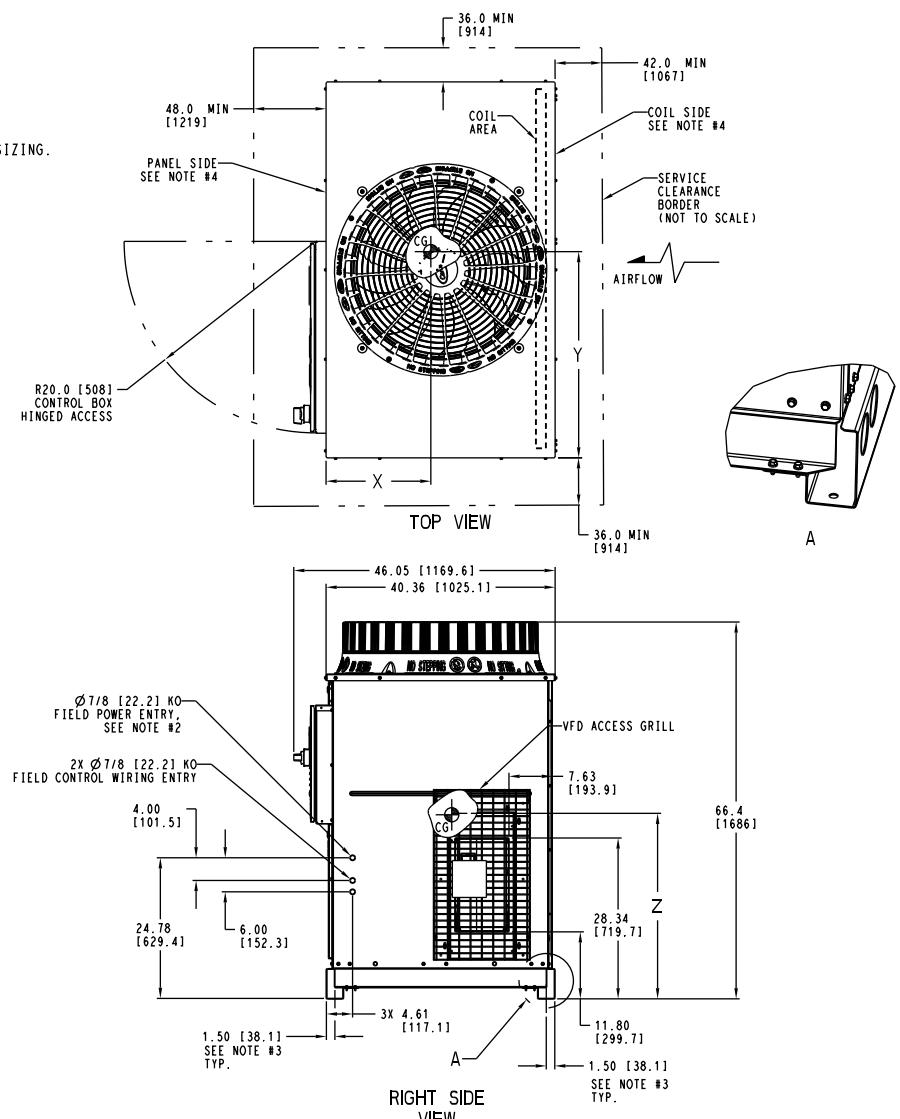
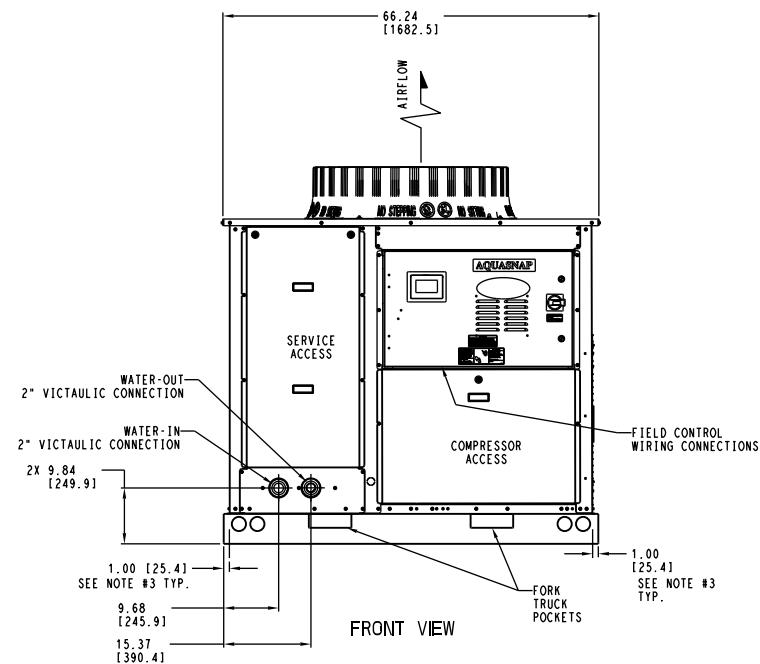
Installation of water systems should follow sound engineering practice as well as applicable local and industry standards. Improperly designed or installed systems may cause unsatisfactory operation and/or system failure. Consult a water treatment specialist or appropriate literature for information regarding filtration, water treatment, and control devices.

UNIT	CENTER OF GRAVITY			WATER CONNECTION VICTAULIC IPS CARBON STEEL	
	X	Y	Z		
STANDARD	30RC010	19.45 [494]	26.50 [673]	25.28 [642]	2"
	30RC015	19.13 [486]	26.14 [664]	25.00 [635]	2"

NOTES:

1. DO NOT CAP OR OTHERWISE OBSTRUCT THE LIQUID LINE TEMPERATURE RELIEF.
2. $\varnothing 7/8$ [22.2] PILOT HOLE PROVIDED FOR LOCATING FIELD POWER WIRING. ACTUAL HOLE REQUIRED DEPENDS ON FIELD WIRE SIZING.
3. $\varnothing 0.524$ [13.30] HOLE USED FOR MOUNTING UNIT.
4. UNIT MUST HAVE CLEARANCES AS FOLLOWS:
 - TOP - DO NOT RESTRICT.
 - COIL SIDE - 42 [1067] FROM SOLID SURFACE.
 - PANEL SIDE - 48 [1219] PER NEC.
5. CARRIER DOES NOT RECOMMEND INSTALLATION IN A PIT.
6. UNIT CAN BE HANDLED USING THE FORK TRUCK LIFT POCKETS.
7. WATER CONNECTIONS RECESSED 2-3/8 INCHES INSIDE UNIT. ALL WATER DRAIN AND VENTING HOLES ARE 1/4" NPT.

DIMENSIONS IN [] ARE IN MILLIMETERS



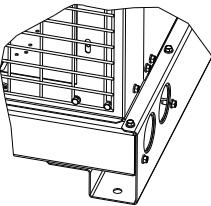
30RC60001010 REV -

Fig. 5 — Dimensions — 30RC010 and 015 Units

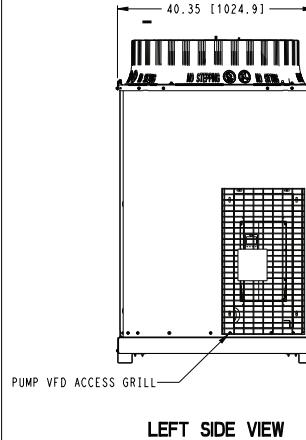
OPTION	UNIT	NO PUMP			SINGLE (1) PUMP NO VFD			SINGLE (1) PUMP VFD			DUAL (2) PUMP NO VFD			UNIT HEIGHT	POWER ENTRY	WATER CONNECTION VICTAULIC
		X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z			
GREENSPEED	30RC020	19.37 [492.1]	37.32 [948.1]	24.89 [632.1]	20.12 [511.1]	47.01 [1194.1]	23.86 [606.1]	20.55 [522.1]	45.31 [1151.1]	23.78 [604.1]	66.5 [1689]	24.9 [631]	2"	36.0 MIN [914]	24.57 [624]	36.9 [936]
	30RC025	19.02 [483.1]	35.20 [894.1]	25.67 [652.1]	20.55 [522.1]	49.41 [1255.1]	24.69 [627.1]	20.91 [531.1]	47.80 [1214.1]	24.57 [624]	78.5 [1994]	36.9 [936]	2"			
	30RC030	19.02 [483.1]	35.20 [894.1]	25.67 [652.1]	20.55 [522.1]	49.41 [1255.1]	24.69 [627.1]	20.91 [531.1]	47.80 [1214.1]	24.57 [624]	78.5 [1994]	36.9 [936]	2"			
LOW AMBIENT	30RC020	18.81 [479.1]	39.09 [993.1]	24.06 [611.1]	20.51 [521.1]	45.20 [1148.1]	23.03 [585.1]	20.94 [532.1]	43.50 [1105.1]	23.03 [585.1]	66.5 [1689]	24.9 [631]	2"	42.0 MIN [1067]	48.0 MIN [1219]	36.0 MIN [914]
	30RC025	18.50 [470.1]	36.50 [927.1]	23.58 [599.1]	20.94 [532.1]	47.99 [1219.1]	22.76 [578.1]	21.30 [541.1]	46.34 [1177.1]	22.76 [578.1]	78.5 [1994]	36.9 [936]	2"			
	30RC030	18.50 [470.1]	36.50 [927.1]	23.58 [599.1]	20.94 [532.1]	47.99 [1219.1]	22.76 [578.1]	21.30 [541.1]	46.34 [1177.1]	22.76 [578.1]	78.5 [1994]	36.9 [936]	2"			

NOTES:

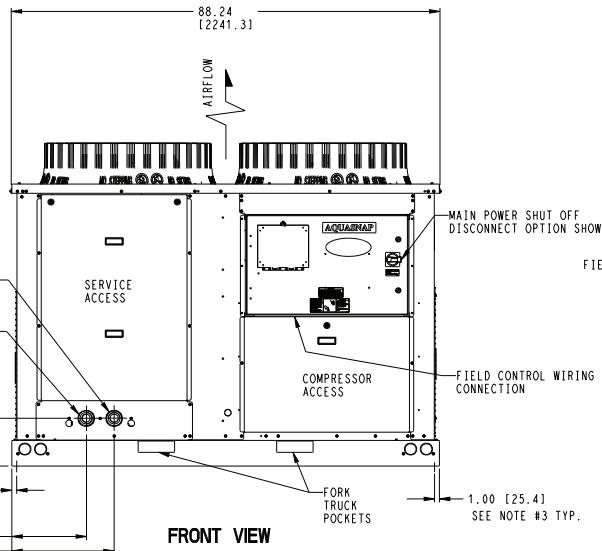
1. DO NOT CAP OR OTHERWISE OBSTRUCT THE LIQUID LINE TEMPERATURE RELIEF.
2. Ø7/8 [22.2] PILOT HOLE PROVIDED FOR LOCATING FIELD POWER WIRING. ACTUAL HOLE REQUIRED DEPENDS ON FIELD WIRE SIZING.
3. Ø0.524 [13.30] HOLE USED FOR MOUNTING UNIT.
4. UNIT MUST HAVE CLEARANCES AS FOLLOWS:
 - TOP - DO NOT RESTRICT
 - COIL AREA - 42" [1067] FROM SOLID SURFACE.
 - PANEL SIDE - 48" [1219] PER RECOMMENDATION.
5. CARRIER DOES NOT RECOMMEND INSTALLATION IN A PIT.
6. UNIT CAN BE HANDLED USING THE FORK TRUCK LIFT POCKETS.
7. WATER CONNECTIONS RECESSED 2-3/8 INCHES INSIDE UNIT. ALL WATER DRAIN AND VENTING HOLES ARE 1/4" NPT.
8. DRAWING SHOWN WITH GREENSPEED OPTION.
9. DIMENSIONS ARE IN "INCH (MM)".



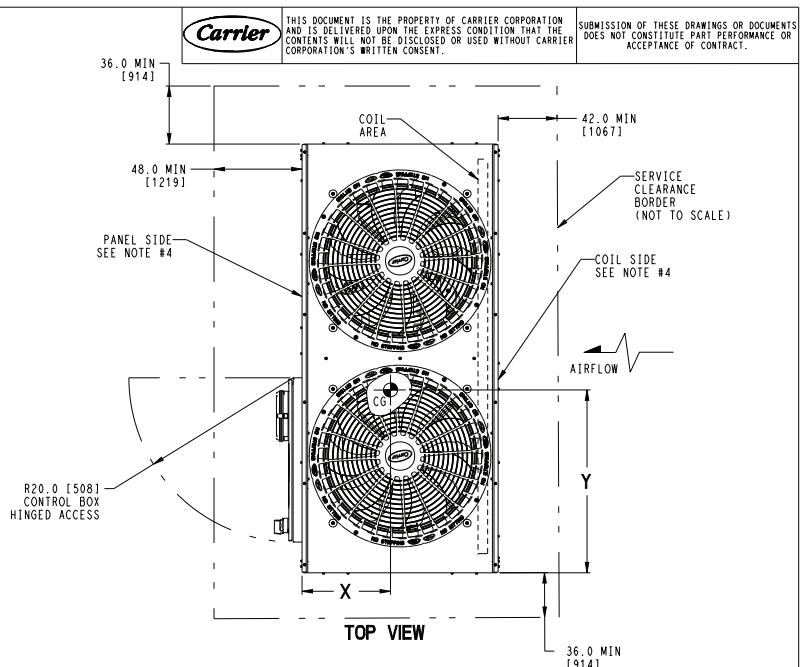
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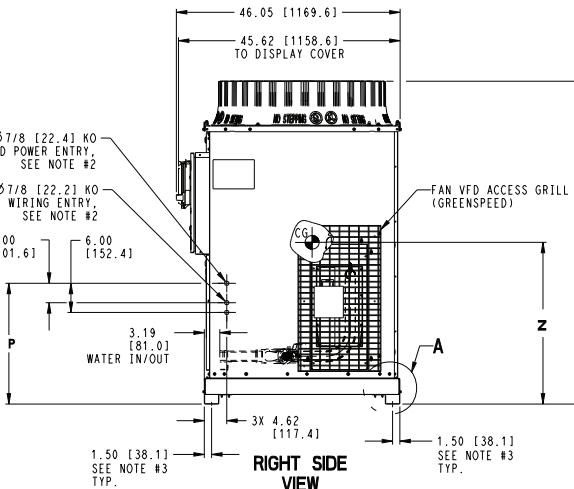
LEFT SIDE VIEW



FRONT VIEW



TOP VIEW



RIGHT SIDE VIEW

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30RC 020-030 UNIT ASSY	30RC60001020	REV
U.S. ECCN:EAR99	1 OF 1	09/11/2024	-			B

Fig. 6 — Dimensions — 30RC020-030 Units

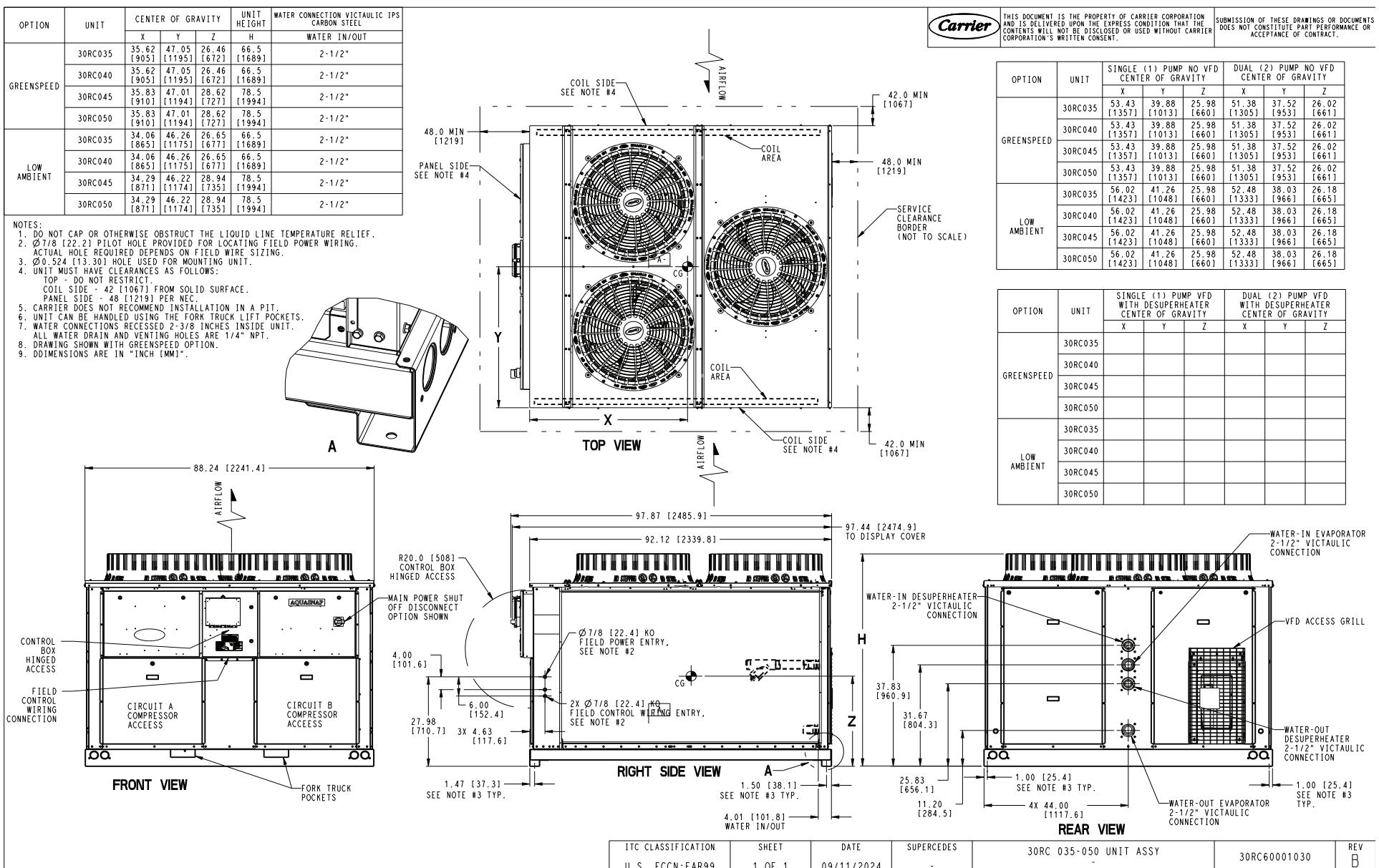


Fig. 7 — Dimensions — 30RC035-050 Units

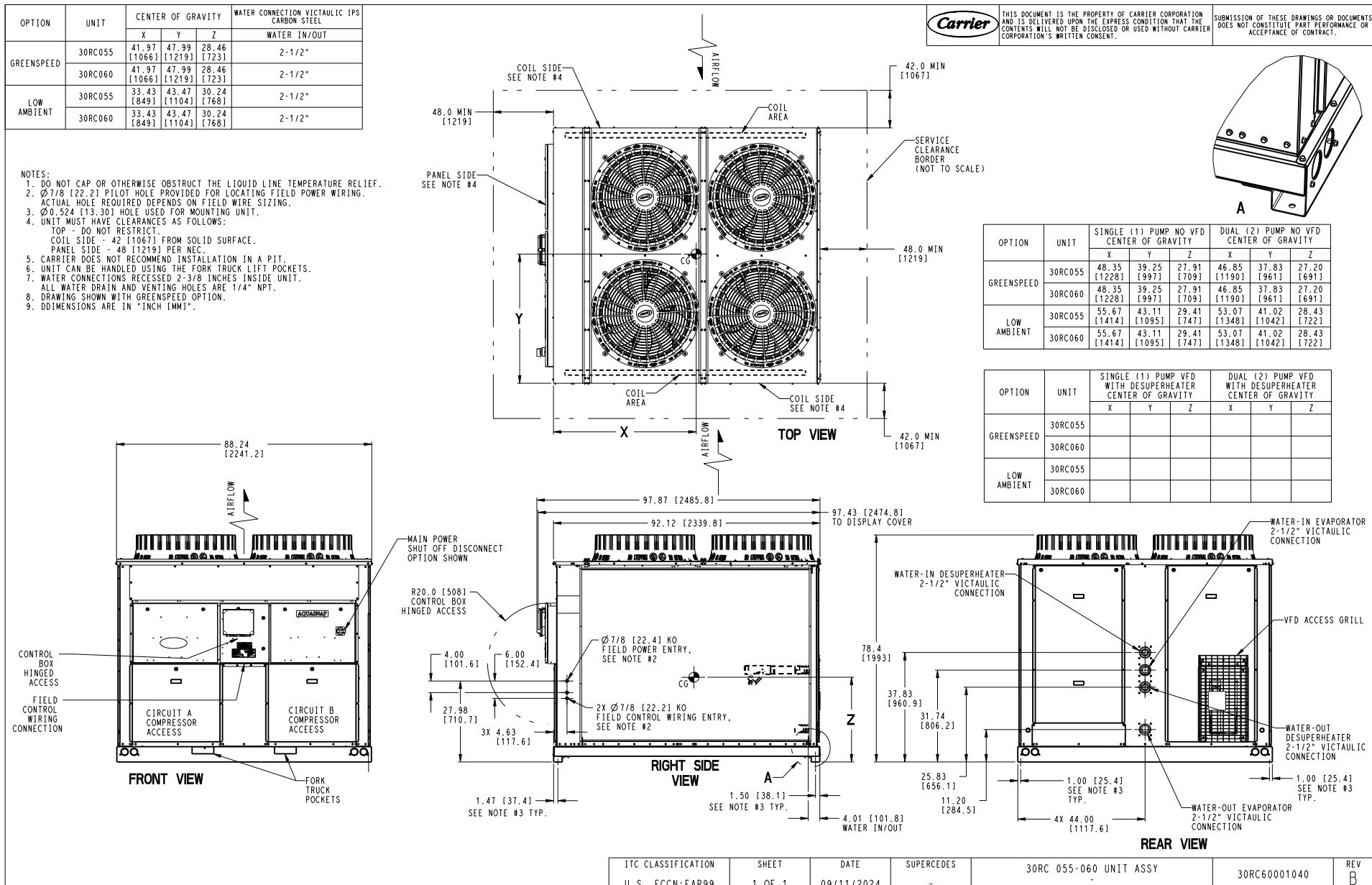


Fig. 8 — Dimensions — 30RC055-060 Units

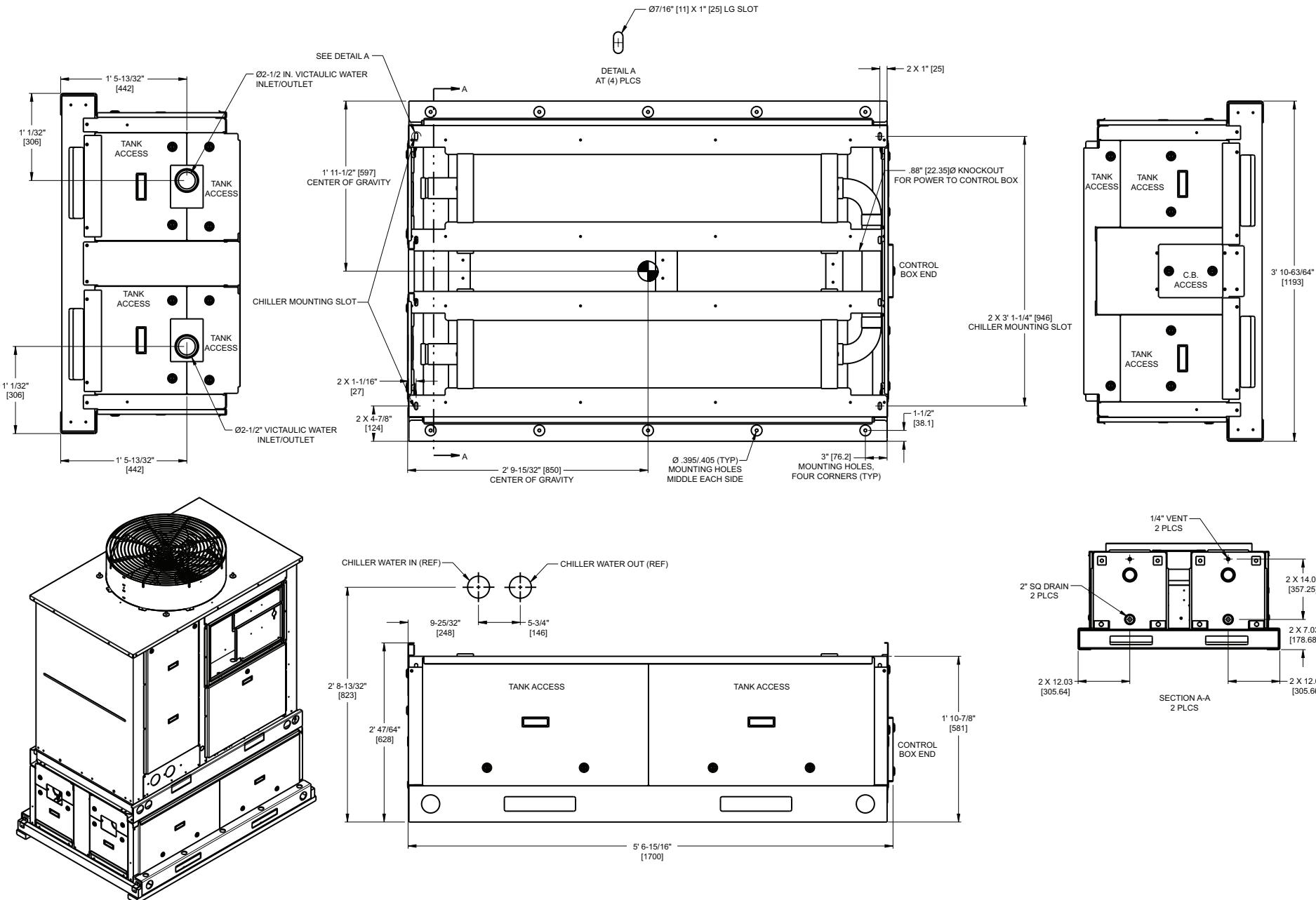


Fig. 9 — Accessory Storage Tank 30RA-900-050 Dimensions — 30RC010,015

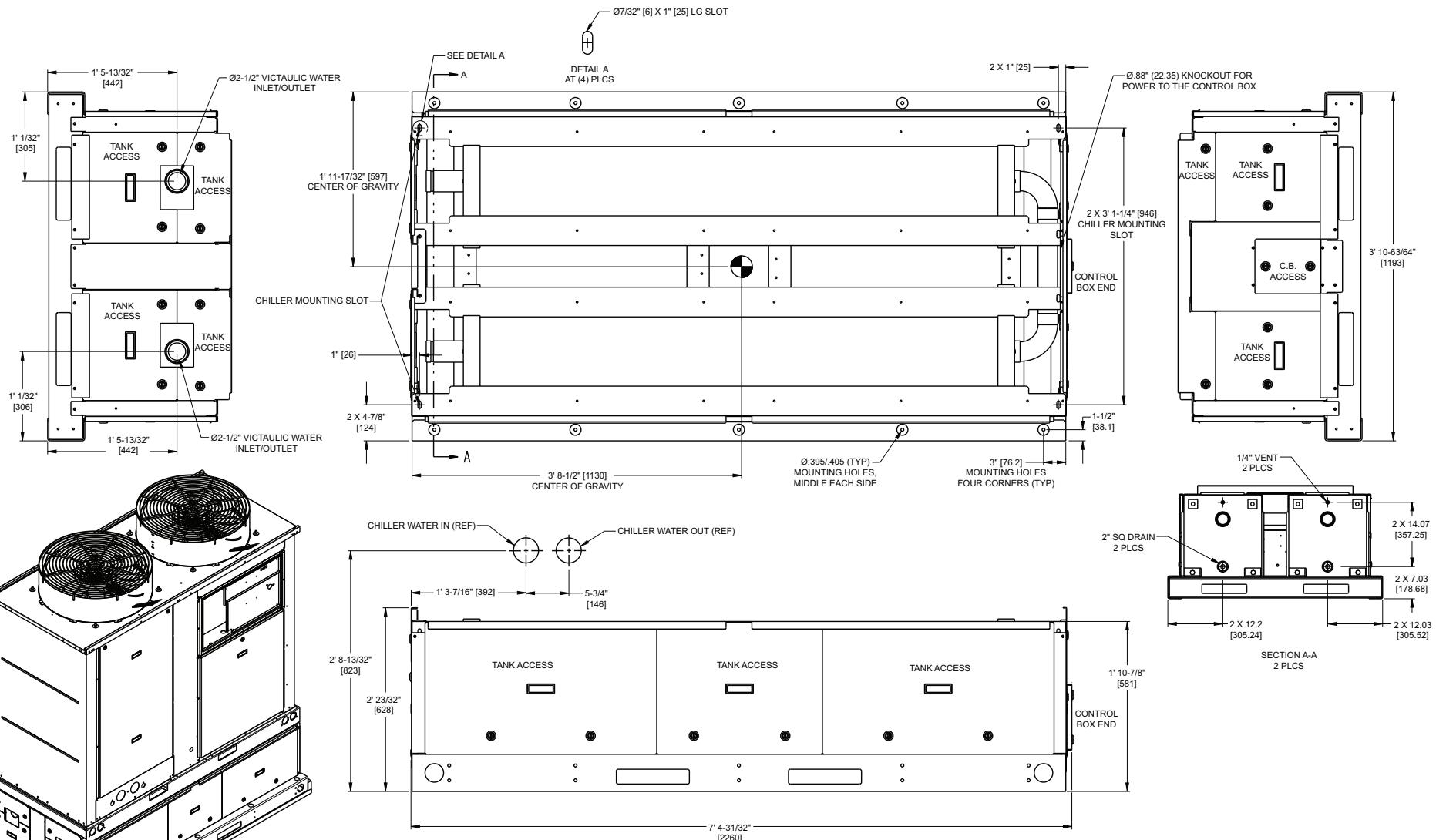
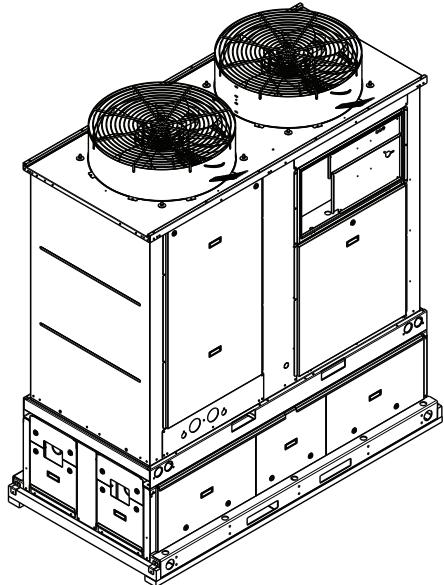


Fig. 10 — Accessory Storage Tank 30RA-900-051 Dimensions — 30RC020-030 Units

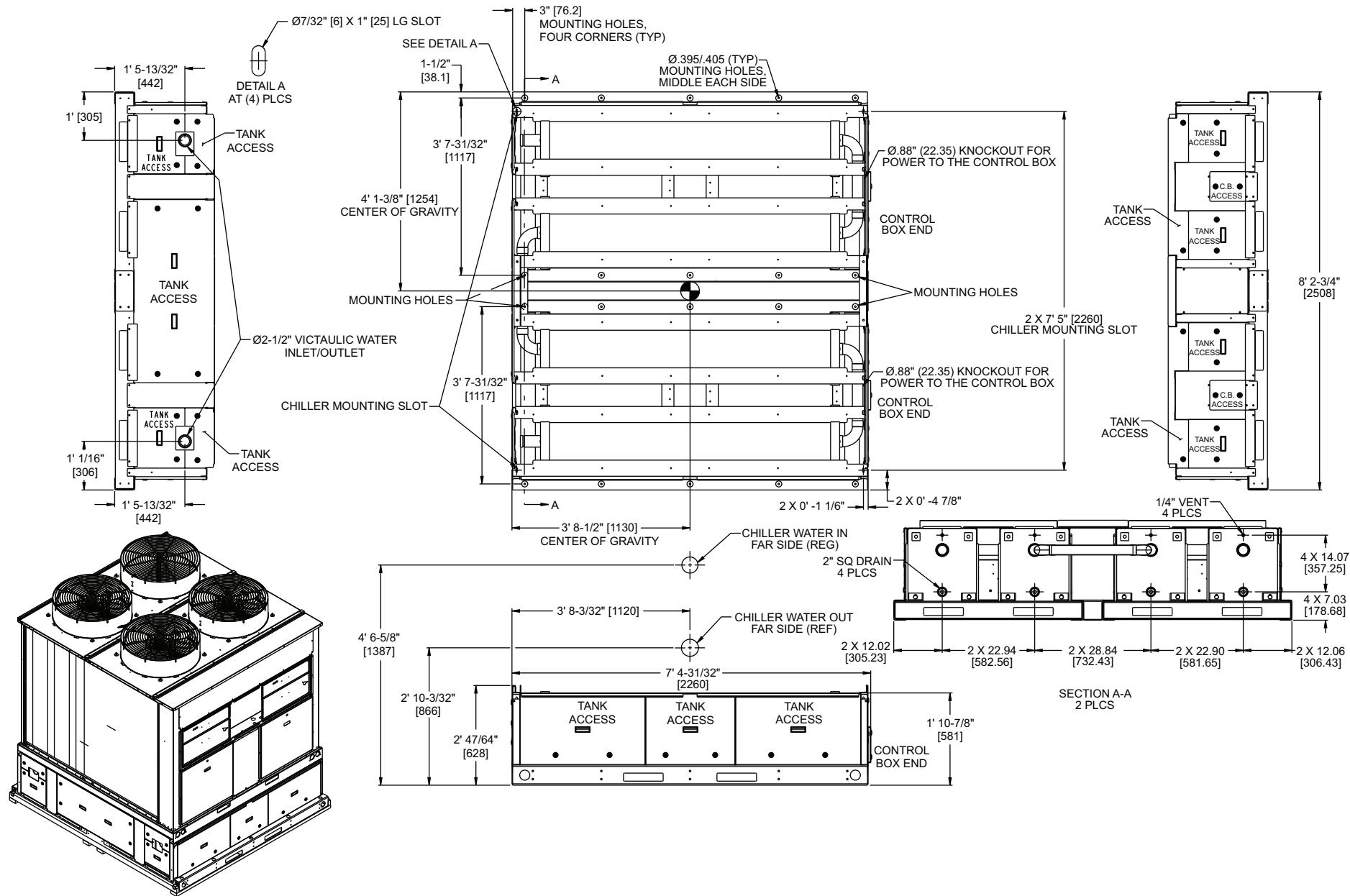


Fig. 11 – Accessory Storage Tank 30RA-900-052 Dimensions – 30RC035-060 Units

Dual Chiller Control Option

If the dual chiller algorithm is utilized the machines must be installed in parallel. An additional chilled water sensor must be installed for each chiller. Install the wells in the common leaving water header. See Fig. 12 and 13.

Parallel chiller control with dedicated pumps is recommended. Chiller must start and stop its own water pump located in its own piping. If pumps are not dedicated for each chiller, then isolation valves are required. Each chiller must open and close its own isolation valve through the unit control (the valve must be connected to the pump outputs). See Fig. 13.

Do not relocate the chiller's leaving water thermistors. They must remain in place for the unit to operate properly. The thermistor well is a 1/4 in. NPT fitting for mounting the well in the piping. Select a location that will allow for removal of the thermistor without any restrictions. Once the well is installed, insert the thermistor into the well utilizing thermal conductive grease. Once the thermistor is in place, it is recommended that a thermistor wire loop be made and secured with a wire tie to the well. Attach the dual leaving water temperature thermistor to TB6-14 and 15 of primary chiller.

A Carrier Comfort Network® (CCN) bus must be connected between the two chillers. For more information regarding Communication Bus Wiring, see the Carrier Comfort Network® (CCN) Interface section of the Controls, Start-Up, Operation, Service, and Troubleshooting guide.

PART NUMBER	DIMENSIONS in. (mm)	
	A	B
10HB50106801	3.10 (78.7)	1.55 (39.4)
10HB50106802	4.10 (104.1)	1.28 (32.5)

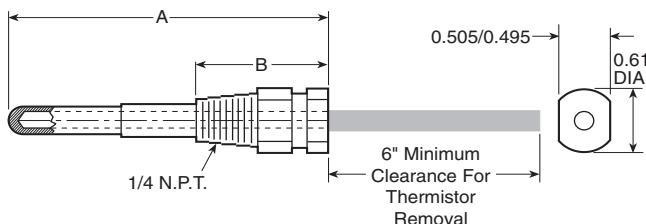
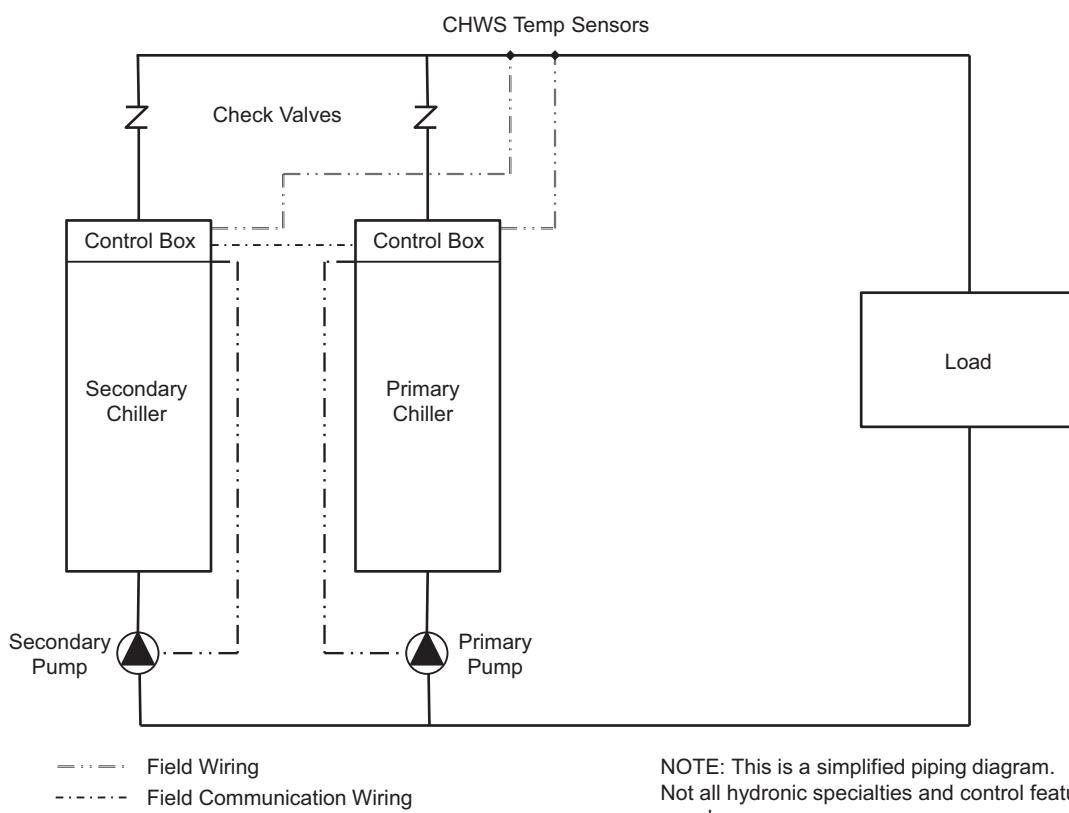


Fig. 12 — Dual Leaving Water Thermistor Well



Depending on piping sizes, use either:

1. HH79NZ014 sensor/10HB50106801 (3-in. sensor/well)
2. HH79NZ029 sensor/10HB50106802 (4-in. sensor/well)

LEGEND

LWT	—	Leaving Water (Fluid) Temperature
—	—	Field Wiring
---	—	Field Communication Wiring

Fig. 13 — Dual Chiller Piping Diagram

VICTAULIC COUPLING INSTALLATION

1. The outside surface of the pipe, between the groove and the pipe end, must be smooth and free from indentations, projections (including weld seams), and roll marks to ensure a leak-tight seal. All oil, grease, loose paint, and dirt must be removed.
2. Apply a thin coat of Victaulic lubricant or silicone lubricant to the gasket sealing lips and exterior.

⚠ CAUTION

Always use a compatible lubricant to prevent the gasket from pinching or tearing during installation. Failure to follow this instruction could result in joint leakage.

3. Position the gasket over the pipe end. Make sure the gasket does not overhang the pipe end.
4. Align and bring the two pipe ends together. Slide the gasket into position and center it between the groove in each pipe end. Make sure no portion of the gasket extends into the groove in either pipe end.
5. Install the housings over the gasket.

NOTE: Make sure the housings' keys engage the grooves completely on both pipe ends.

⚠ CAUTION

Make sure the gasket does not become rolled or pinched while installing the housings. Failure to follow this instruction could cause damage to the gasket, resulting in joint leakage.

6. Install the bolts, and thread a nut finger-tight onto each bolt. For couplings supplied with stainless steel hardware, apply an anti-seize compound to the bolt threads. Make sure the oval neck of each bolt seats properly in the bolt hole.
7. Tighten the nuts evenly by alternating sides until metal-to-metal contact occurs at the bolt pads. Make sure the housings' keys engage the grooves completely.

NOTE: It is important to tighten the nuts evenly to prevent gasket pinching.

8. Visually inspect the bolt pads at each joint to ensure metal-to-metal contact is achieved.

UNITS WITH FACTORY-INSTALLED HYDRONIC PACKAGES

The 30RC chillers with factory-installed hydronic packages are designed for use with closed systems, meaning that there is no

more than one water-air interface in the water loop. Cooling tower loops, for example, have two water-air interfaces (sump and nozzles) and would thus be classified as open, whereas a correctly designed chilled water loop with the only water-air interface being in the expansion tank is closed. Since closed and open water systems behave very differently, these instructions assume that the chilled water loop is closed. A system installed incorrectly such that air is not handled properly — pipe leaks, vent leaks, air in pipes, etc. — may behave as an open system and thus have unsatisfactory operation. Pump seal wear can also cause leaks that cause poor system operation.

Proper closed system design and installation procedures should be followed closely. The system must be constructed with pressure-tight components and thoroughly tested for installation leaks. Factory-supplied hydronic systems are available with single or dual (for back-up) pumps.

Figures 14-16 show typical installations with components that might be installed with the hydronic package of the 30RC unit. The factory-installed system includes all of the components within the dashed lines. Figure 17 illustrates a typical dual pump package for the 010-030 size models.

NOTE: For units with single pumps, it is recommended that isolation (shutoff) valves be placed exterior to the unit to allow removal and service of the entire pump assembly, if necessary. Units with dual pumps have pump isolation valves provided. Also, if the unit is isolated with valves, a properly sized pressure relief valve should be installed in the piping between the unit and the valves, following all applicable state and local codes.

System Pressurization

A proper initial cold fill pressure must be established before the filling of the unit. The initial cold fill pressure is the pressure applied at the filling point to fill a system to its highest point, plus a minimum pressure at the top of the system (4 psi [28 kPa] minimum) to operate air vents and positively pressurize the system.

The compression tank (sometimes called expansion tank) is very important to system pressurization. The compression tank actually serves several purposes:

1. Provides net positive suction head required (NPSHR) for the pump to operate satisfactorily.
2. Sets system pressure.
3. Accommodates expansion/contraction of water due to temperature changes.
4. Acts as a pressure reference for the pump.

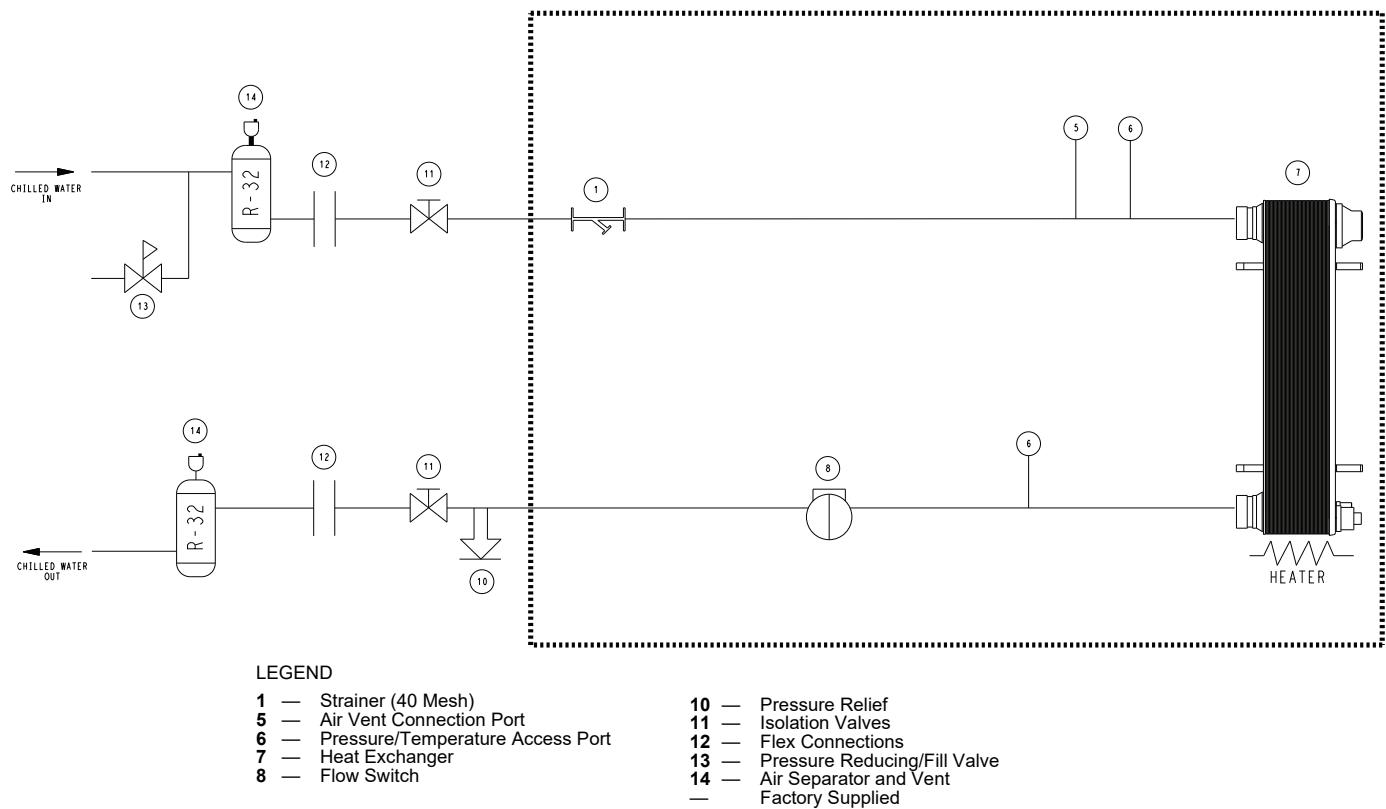


Fig. 14 — Typical Piping Diagram — 30RC Units without Hydronic Package

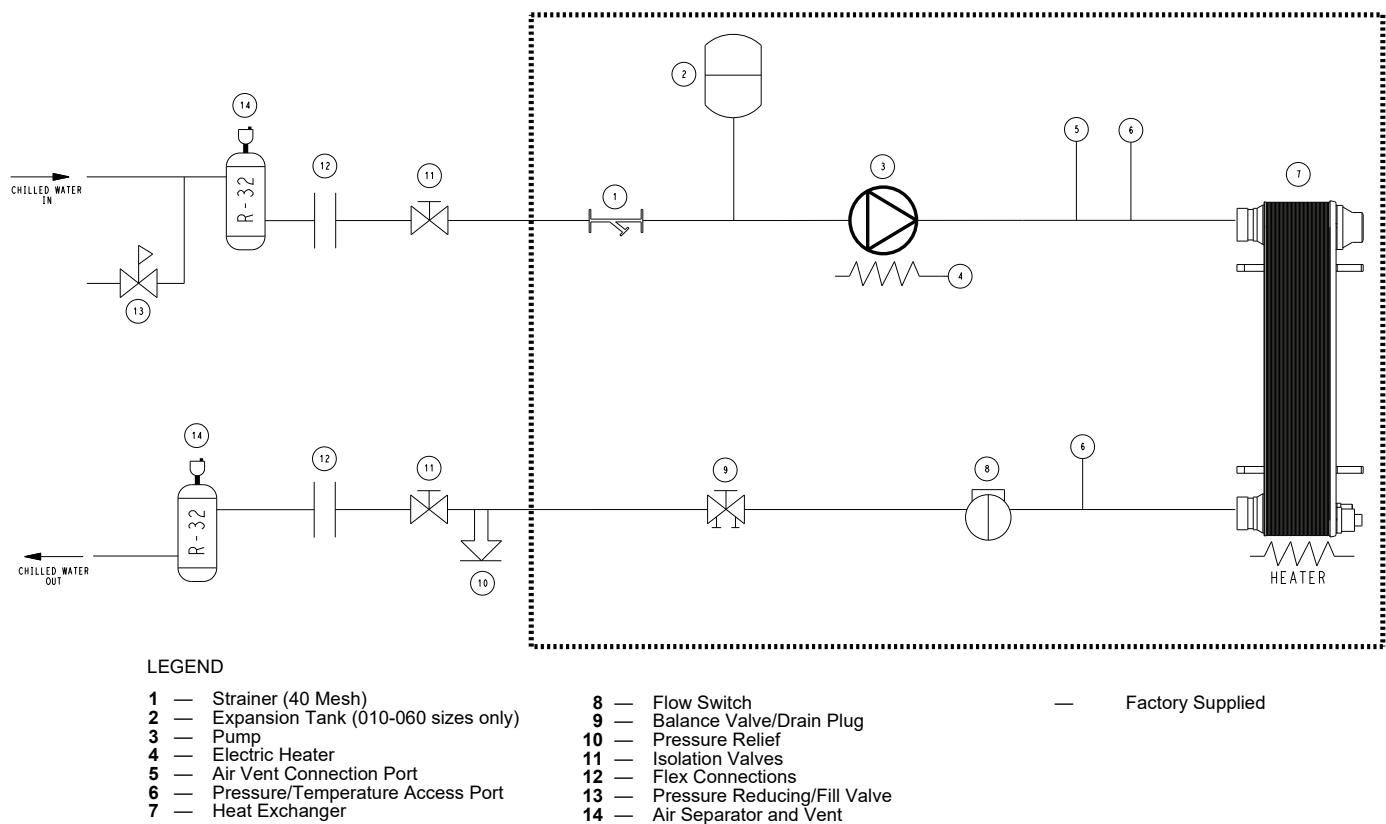
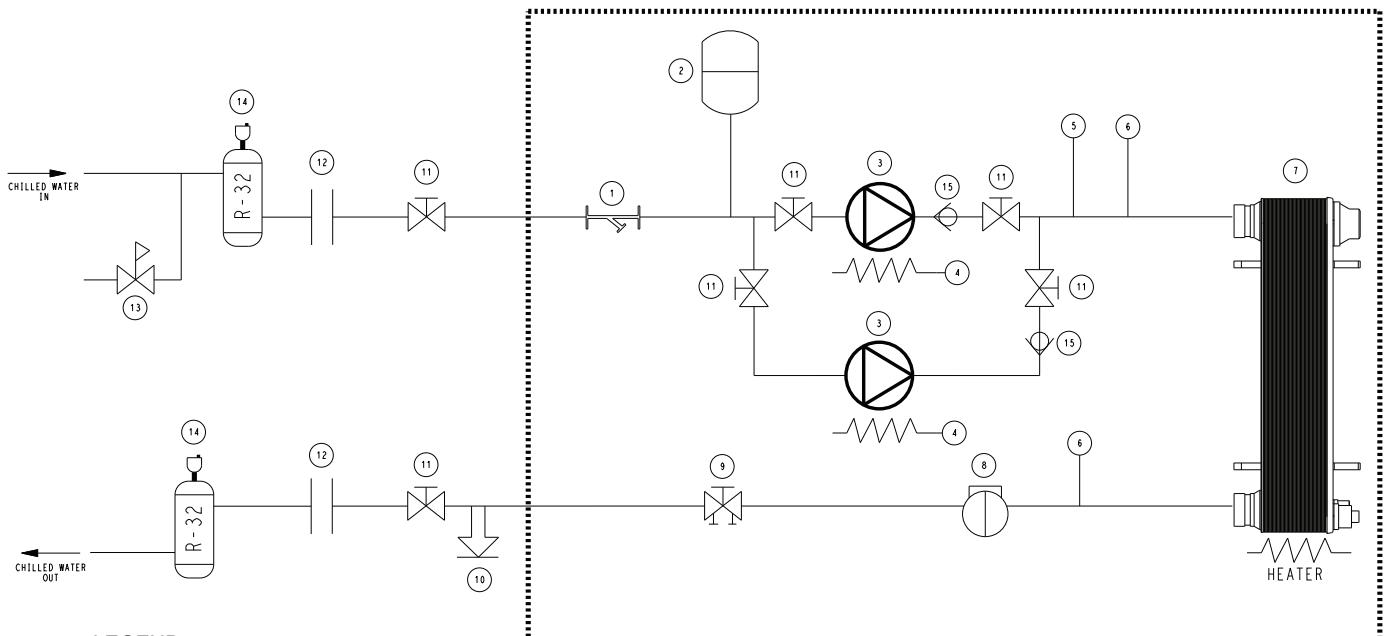


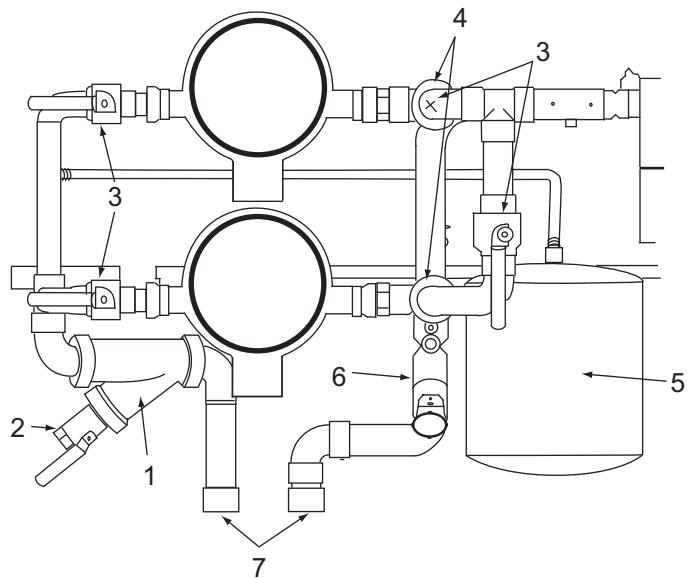
Fig. 15 — Typical Piping Diagram — 30RC Units with Single Hydronic Package



LEGEND

1 — Strainer/Blow-Down Valve	9 — Balance Valve/Drain Plug
2 — Expansion Tank (011-060 sizes only)	10 — Pressure Relief
3 — Pump	11 — Isolation Valves
4 — Electric Heater	12 — Flex Connections
5 — Air Vent Connection Port	13 — Pressure Reducing/Fill Valve
6 — Pressure/Temperature Access Port	14 — Air Separator and Vent
7 — Heat Exchanger	15 — Check Valve
8 — Flow Switch	— Factory Supplied

Fig. 16 — Typical Piping Diagram — 30RC Units with Dual Hydronic Package



1 — Strainer	4 — Discharge Check Valve (Dual Pumps Only)
2 — Blow-Down Valve	5 — Expansion Tank
3 — Service Valves	6 — Balancing Valve with Drain Plug
7 — Field Connections	

Fig. 17 — Typical Dual Pump Package (010-030 sizes only)

The compression tank pressure must be set BEFORE the system is filled. Expansion tanks are factory supplied. The tanks are pre-charged at the factory to 40 psig (276 kPa). If the 30RC unit with expansion tank is the high point in the system, tank pre-charge pressure of 40 psig (276 kPa) will be adequate. If the 30RC unit with expansion tank is NOT at the high point in the system, then the minimum pre-charge pressure for the water system must be determined using Table 11 and the method below:

$$\begin{aligned}\text{Tank Pressure} &= 4 + (\text{height from tank to top of system in feet}/\text{X}) \\ &[27.6 + (\text{height in m} \times 22.6)/\text{X}]\end{aligned}$$

For example, assuming a system containing a 20% concentration of ethylene glycol and 50 ft (15.2 m) in height from the top of the system to the expansion tank, the minimum tank pre-charge pressure would be:

$$\begin{aligned}\text{Tank Pressure} &= 4 + (50 / 2.38) = 25.0 \text{ psig} \\ &= 27.6 + (15.2 \times 22.6 / 2.38) = 171.9 \text{ kPa}\end{aligned}$$

Table 11 — “X” Factor for Setting Tank Pressure

% GLYCOL	ETHYLENE GLYCOL	PROPYLENE GLYCOL
0 (pure water)	2.31	2.31
10	2.36	2.33
20	2.38	2.36
30	2.40	2.38
40	2.43	2.38
50	2.47	2.40

NOTE: If expansion tanks are placed elsewhere in the system this method cannot be used since extra pressure drop between the tank and the pump must be accounted for.

NOTE: If the system requires a pre-charge greater than 40 psig (276 kPa), increase pressure as described below.

Expansion Tank Pre-Charge

To pre-charge the expansion tank, do the following steps:

1. Check the tank air pressure at the pre-charge connection with an accurate pressure gauge. Adjust as needed.
2. If additional pressure is required, charge the tank with oil-free compressed air or nitrogen gas. Occasionally check the pressure as when filling a tire.
3. Check the air valve for leakage. If it leaks, relieve the pressure and replace the core with a Schrader-type tire core. DO NOT depend on the valve cap to seal the leak.

Once the system is pressurized, the pressure at the connection point of the expansion tank to water piping will not change unless the water loop volume changes (either due to addition/subtraction of water or temperature expansion/contraction). The pressure at this point remains the same regardless of whether or not the pump is running.

Since the expansion tank acts as a reference point for the pump, there cannot be two reference points (two expansion tanks) in a system (unless manifolded together). If system volume or other design considerations warrant the placement of another expansion tank somewhere in the system, the expansion tank in the 30RC hydronic package MUST be disconnected from its hose and the end of the hose securely plugged.

This is also true for applications where two or more 30RC chillers are placed in parallel. There should not be more than one expansion

tank in the system (as seen in Fig. 17) unless manifolded together. When multiple 30RC chillers are applied in parallel, the expansion tanks must be disconnected from the 30RC hydronic package. It is permissible to install the expansion tank(s) in a portion of the return water line that is common to all pumps, providing that the tank is properly sized for combined system volume.

If the application involves two or more chillers in a primary/secondary system, a common place for mounting the expansion tank is in the chilled water return line, just before the decoupler. Refer to Fig. 18 for placement of expansion tank in primary/secondary systems.

The expansion tank included in the 30RC hydronic package is a diaphragm tank, meaning that a flexible diaphragm physically separates the water/air interface. With this type of expansion tank, it is undesirable to have any air in the water loop. See the section on air separation below for instructions on providing air separation equipment.

AIR SEPARATION

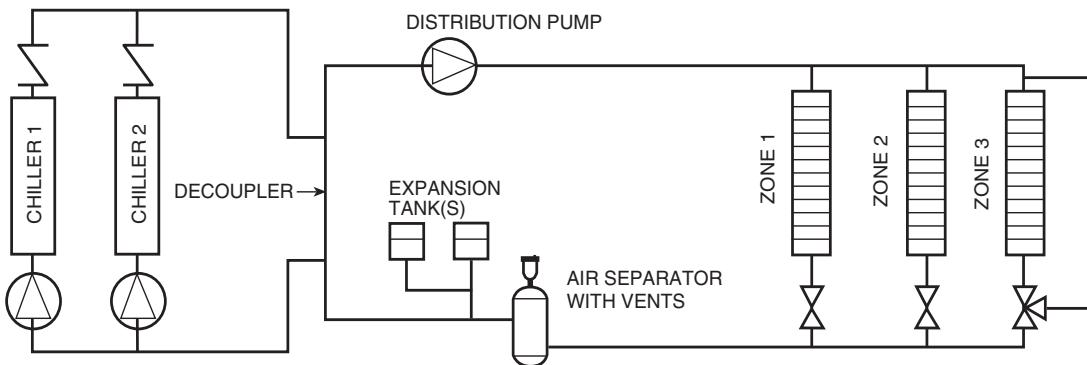
For proper system operation, it is essential that water loops be installed with proper means to manage air in the system. Free air in the system can cause noise, reduce terminal output, stop flow, or even cause pump failure due to pump cavitation. For closed systems, equipment should be provided to eliminate all air from the system.

The amount of air that water can hold in solution depends on the pressure and temperature of the water/air mixture. Air is less soluble at higher temperatures and at lower pressures. Therefore, separation can best be done at the point of highest water temperature and lowest pressure. Typically, this point would be on the suction side of the pump as the water is returning from the system or terminals. Generally speaking, this is the best place to install an air separator, if possible.

1. Install automatic air vents at all high points in the system. (If the 30RC unit is located at the high point of the system, a vent can be installed on the piping entering the heat exchanger on the 1/4-in. NPT female port.)
2. Install an air separator in the water loop, at the place where the water is at higher temperatures and lower pressures — usually in the chilled water return piping. On a primary-secondary system, the highest temperature water is normally in the secondary loop, close to the decoupler. Preference should be given to that point on the system (see Fig. 18). In-line or centrifugal air separators are readily available in the field.

It may not be possible to install air separators at the place of lowest pressure and highest temperature. In such cases, preference should be given to the points of highest temperature. It is important that pipe be sized correctly so that free air can be moved to the point of separation. Generally, a water velocity of at least 2 ft (610 mm) per second will keep free air entrained and prevent it from forming air pockets.

Automatic vents should be installed at all physically elevated points in the system so that air can be eliminated during system operation. Provision should also be made for manual venting during the water loop fill. It is important that the automatic vents be located in accessible locations for maintenance purposes, and that they be located where they can be prevented from freezing.



NOTE: Expansion tanks in the 30RC hydronic kits must be disconnected for chillers placed parallel in the primary water loop.

Fig. 18 – Typical Air Separator and Expansion Tank Location on Primary-Secondary Systems

UNITS WITH OPTIONAL PARTIAL HEAT RECOVERY

The 30RC 035-060 units can be equipped with a factory-installed partial heat recovery package consisting of one brazed-plate heat exchanger (desuperheater) per circuit to allow for heat from compressor discharge gas to be partially recovered for heating process water. Units equipped with partial heat recovery must also be equipped with variable speed fans. The partial heat recovery desuperheater fluid connections are at the end of the unit opposite the control panel. Refer to the Controls, Start-Up, Operation, Service, and Troubleshooting literature for detailed operational information.

The partial heat recovery desuperheaters have water-side grooved coupling-type connections (follow connection directions as provided by the coupling manufacturer). The water supply and water return for each desuperheater are manifolded together such that there is a single water inlet and a single water outlet to the partial heat recovery system. (See Fig. 19.) Both inlet and outlet connections are nominal 2 in. Provide proper support for the piping. The hydraulic connection on the desuperheater water inlet and outlet must not generate any local mechanical stress on the exchangers. If necessary, install flexible couplings. If external grilles or hail guards have been added, holes must be cut for field piping and insulation. A field-supplied strainer with a minimum size of 20 mesh must be installed within 10 ft (3.0 m) of the inlet to the desuperheaters. Field-supplied water flow rate balancing and control valves shall be fitted at the outlet of the desuperheaters.

The minimum entering water temperature is 70°F (21.1°C). See Table 12 for entering water temperature ranges. The volume of the partial heat recovery water loop must be as low as possible to be able to rapidly increase the temperature during start-up. If entering water temperatures are below the minimum entering operational temperature, 80°F (26.7°C), then a field-installed 3-way valve may be required to control entering water temperature to the minimum required temperature. If a 3-way valve is required, it is recommended that the valve be located within 40 ft (12.2 m) of the desuperheaters and that the field-supplied circulating pump be located between the valve and the desuperheaters. It is essential for the desuperheater water loop to comprise a valve and an expansion vessel, which must be selected to take the volume of the water loop and the maximum possible temperature into account (248°F/120°C) in the event that the circulating pump stops running.

See Fig. 20 for a typical piping diagram of the partial heat recovery desuperheaters and 3-way valve location. All piping must follow standard piping techniques. Refer to Carrier System Design Manual or appropriate ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) handbook for details.

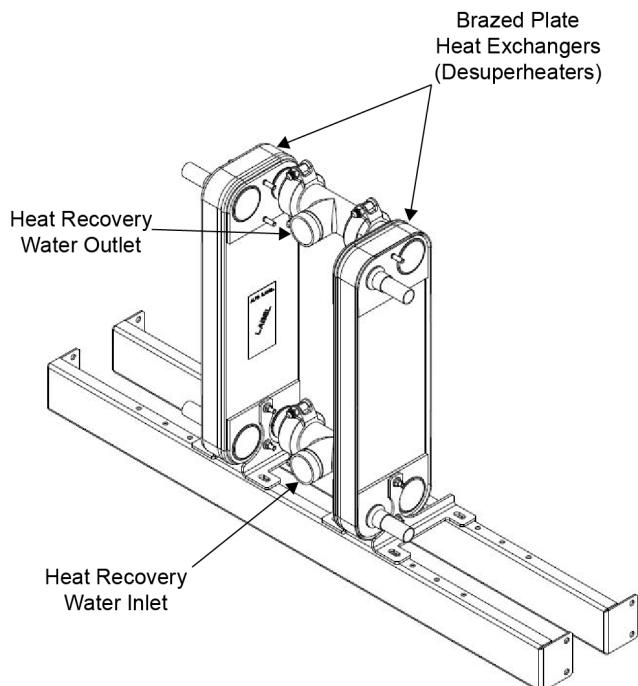


Fig. 19 – Partial Heat Recovery Desuperheaters

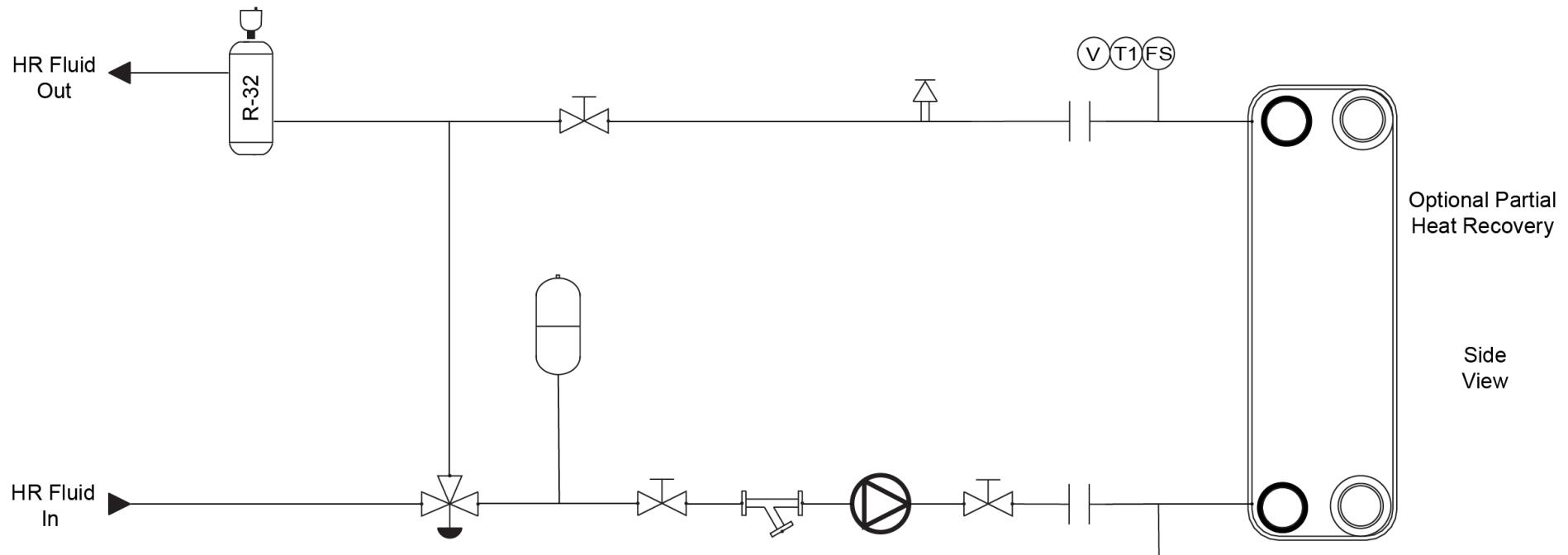
Table 12 – Heat Recovery Inlet Temperatures

PARTIAL HEAT RECOVERY ENTERING WATER TEMPERATURE	MIN °F / °C	MAX °F / °C
Entering Water Temperature at Start-Up	70 / 21.1	150 / 65.6
Entering Water Temperature During Operation	80 / 26.7	150 / 65.6

CAUTION

Do not circulate water through unit without strainers in place. Failure to use the strainers represents abuse and may impair or otherwise negatively affect the Carrier product warranty.

All desuperheaters used on 30RC units are single wall heat exchangers and are not suitable for potable water. This may require the use of secondary heat exchangers. Refer to UL 60335-2-40 Annex GG.6 for further guidelines.



05

LEGEND

- D** — Drain, Field Supplied
- FS** — Flow Switch, Field Supplied
- HR** — Heat Recovery
- V** — Vent, Field Supplied
- T1** — Leaving Water Thermistor, Field Supplied
- T2** — Entering Water Thermistor, Field Supplied

* Field-supplied and installed.

† Required to be installed within 10 ft. (3 m) of desuperheater inlet.

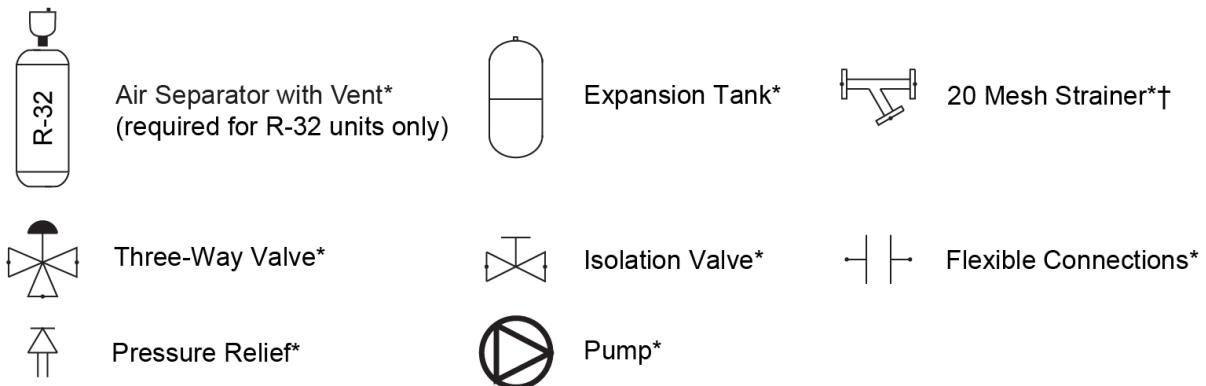


Fig. 20 — Typical Piping Diagram for 30RC Partial Heat Recovery System

Step 4 — Fill the Chilled Water Loop

WATER SYSTEM CLEANING

Proper water system cleaning is of vital importance. Excessive particulates in the water system can cause excessive pump seal wear, reduce or stop flow, and cause damage of other components. Water quality should be maintained within the limits indicated in Table 13. Failure to maintain proper water quality may result in heat exchanger failure.

CAUTION

Failure to properly clean all piping and components of the chilled water system before unit start-up may result in plugging of the heat exchanger, which can lead to poor performance, nuisance alarms, and damage from freezing. Freezing damage caused by an improperly cleaned system represents abuse and may impair or otherwise negatively affect the Carrier product warranty.

1. Install a temporary bypass around the chiller to avoid circulating dirty water and particulates into the pump package and chiller during the flush. Use a temporary circulating pump during the cleaning process. Also, be sure that there is capability to fully drain the system after cleaning. See Fig. 21.
2. Be sure to use a cleaning agent that is compatible with all system materials. Be especially careful if the system contains any galvanized or aluminum components. Both detergent-dispersant and alkaline-dispersant cleaning agents are available.
3. It is a good idea to fill the system through a water meter. This provides a reference point for the future for loop volume readings, and it also establishes the correct quantity of cleaner needed in order to get the required concentration.
4. Use a feeder/transfer pump to mix the solution and fill the system. Circulate the cleaning system for the length of time recommended by the cleaning agent manufacturer.
 - a. After cleaning, drain the cleaning fluid and flush the system with fresh water.
 - b. A slight amount of cleaning residue in the system can help keep the desired, slightly alkaline, water pH of 8 to 9. Avoid a pH greater than 10, since this will adversely affect pump seal components.
 - c. A side stream filter is recommended (see Fig. 22) during the cleaning process. Filter side flow rate should be enough to filter the entire water volume every 3 to 4 hours. Change filters as often as necessary during the cleaning process.
 - d. Remove temporary bypass when cleaning is complete.

A 20-mesh strainer with a blow-down valve is standard on all 30RC units, both with and without hydronic packages. The blow-down valve allows removal of particulates caught in the strainer without complete removal of the screen. A female NPT connection is provided on the valve, allowing hose connection for drainage outside the unit.

Carrier's PIC6 controls have a built-in feature to remind building owners or operators to clean the strainer by discharging the blow-down valve at a pre-set time interval. Properly installed and cleaned systems will rarely need the strainer cleaned after the initial fill. This time interval is user-configurable.

Table 13 — Water Quality Characteristics and Limitations

WATER CHARACTERISTIC	QUALITY LIMITATION
Alkalinity (HCO_3^-)	70 – 300 ppm
Sulfate (SO_4^{2-})	Less than 70 ppm
$\text{HCO}_3^-/\text{SO}_4^{2-}$	Greater than 1.0
Electrical Conductivity	10 – 500 $\mu\text{S}/\text{cm}$
pH	7.5 – 9.0
Ammonia (NH_3)	Less than 2 ppm
Chlorides (Cl^-)	Less than 300 ppm
Free chlorine (Cl_2)	Less than 1 ppm
Hydrogen Sulfide (H_2S) ^a	Less than 0.05 ppm
Free (aggressive) Carbon Dioxide (CO_2) ^b	Less than 5 ppm
Total Hardness ($^{\circ}\text{dH}$)	4.0 – 8.5
Nitrate (NO_3^-)	Less than 100 ppm
Iron (Fe)	Less than 0.2 ppm
Aluminum (Al)	Less than 0.2 ppm
Manganese (Mn)	Less than 0.1 ppm

NOTE(S):

- a. Sulfides in the water quickly oxidize when exposed to air, requiring that no agitation occur as the sample is taken. Unless tested immediately at the site, the sample will require stabilization with a few drops of one Molar zinc acetate solution, allowing accurate sulfide determination up to 24 hours after sampling. A low pH and high alkalinity cause system problems, even when both values are within the ranges shown. The term pH refers to the acidity, basicity, or neutrality of the water supply. Below 7.0, the water is considered to be acidic. Above 7.0, water is considered to be basic. Neutral water contains a pH of 7.0.
- b. Dissolved carbon dioxide can either be calculated from the pH and total alkalinity values, shown below, or measured on the site using a test kit. Dissolved Carbon Dioxide, PPM = $\text{TA} \times 2^{[(6.3-\text{pH})/0.3]}$ where TA = Total Alkalinity, PPM as CaCO_3 .

SYSTEM

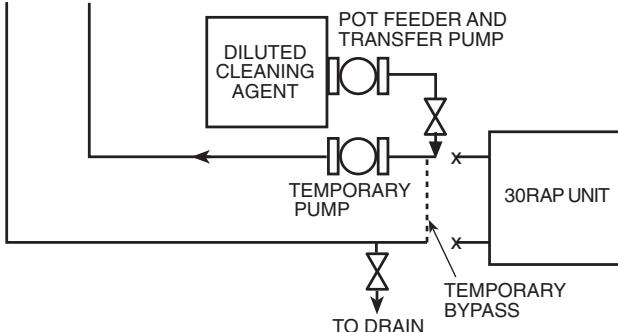


Fig. 21 — Typical Set Up for Cleaning Process

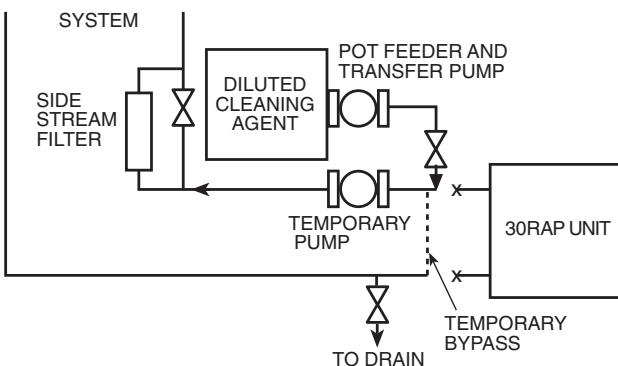


Fig. 22 — Cleaning Using a Side Stream Filter

FILLING THE SYSTEM

See Table 14 for pump impeller sizes. The initial fill of the chilled water system must accomplish three purposes:

1. The entire piping system must be filled with water.
2. The pressure at the top of the system must be high enough to vent air from the system (usually 4 psig [28 kPa] is adequate for most vents).
3. The pressure at all points in the system must be high enough to prevent flashing in the piping or cavitation in the pump.

The pressure created by an operating pump affects system pressure at all points except one — the connection of the compression tank to the system. This is the only location in the system where pump operation will not give erroneous pressure indications during the fill. Therefore, the best location to install the fill connection is close to the expansion tank. An air vent should be installed close by to help eliminate air that enters during the fill procedure.

Ensure the following when filling the system:

1. Remove temporary bypass piping and cleaning/flushing equipment.
2. Check to make sure all drain plugs are installed.
3. Open the blow-down valve to flush the strainer.

Normally, a closed system needs to be filled only once. The actual filling process is generally a fairly simple procedure. All air should be purged or vented from the system. Thorough venting at the high points and circulation at room temperature for several hours is recommended.

NOTE: Local codes concerning backflow devices and other protection of the city water system should be consulted and followed to prevent contamination of the public water supply. This is especially important when antifreeze is used in the system.

Set Water Flow Rate

Once the system is cleaned, pressurized, and filled, the flow rate through the chiller must be established. On units with the hydronic package, this can best be done using the balancing valve.

In order to adjust the balancing valve, put a differential pressure gauge across the pressure taps on the valve. Make sure that all system isolation and control valves are open. Use Tables 15 and 16 to determine gpm.

1. Measure the pressure drop across the balancing valve. If the pressure reading is in psig, multiply psig by 2.31 to convert to feet of water before using Tables 15 and 16.

2. Go to the row in the chart corresponding to the setting on the valve, interpolating if necessary.

3. The gpm corresponding to the pressure drop measured is the flow through the balancing valve.

NOTE: Carrier recommends a differential pressure gauge when measuring pressures across the pumps or balancing valves. This provides for greater accuracy and reduces error build-up that often occurs when subtracting pressures made by different gauges.

On primary/secondary systems, it is advisable to set the 30RC balancing valve to maintain design flow plus 10% through the chiller.

A rough estimate of water flow can also be obtained from the pressure gauges across the 30RC heat exchanger. Figures 23-26 show the pump curves. Figures 27-30 show the relationship between gpm and heat exchanger pressure drop. It should be noted that these curves are for "clean" heat exchangers; they do not apply to heat exchangers with fouling. To read the chart, subtract the readings of the two pressure gauges on the hydronic kit. This number is the pressure drop across the heat exchanger. Adjust the factory-installed balancing valve or external balancing valve (units without hydronic package) until the correct pressure drop is obtained for the required gpm. Total unit pressure drop is found in Appendix A.

Water Treatment

Fill the fluid loop with water (or suitable inhibited antifreeze solution) and a corrosion-resistant inhibitor suitable for the water of the area. Consult the local water treatment specialist for characteristics of system water and a recommended inhibitor for the evaporator fluid loop.

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

CAUTION

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

Table 14 — Pump Impeller Sizes (60 Hz Chillers Only)^a

UNIT 30RC	PUMP Hp	SINGLE PUMP					DUAL PUMP				
		Option Code ^b		rpm	Impeller Dia. (in.)	Pump Curve	Option Code ^b		rpm	Impeller Dia. (in.)	Pump Curve
		Non-VFD	VFD				Non-VFD	VFD			
011-030	1.5	2	N/A	3500	4.25	I	9	N/A	3500	4.25	I
	3	3	N/A	3500	4.75	I	B	N/A	3500	4.75	I
	3 (High Head)	4	N/A	3500	5.00	I	C	N/A	3500	5.00	I
	5	5	N/A	3500	5.50	II	D	N/A	3500	5.50	II
035-045	3	3	N/A	3500	4.75	I	B	N/A	3500	4.75	I
	3 (High Head)	4	N/A	3500	5.25	I	C	N/A	3500	5.25	I
	5	5	N/A	3500	4.50	III	D	N/A	3500	4.50	III
	5 (High Head)	6	N/A	3500	4.88	III	F	N/A	3500	4.88	III
050-060	7.5	7	N/A	3500	5.50	IV	G	N/A	3500	5.50	IV
	3 (High Head)	4	N/A	3500	5.25	I	C	N/A	3500	5.25	I
	5	5	N/A	3500	4.50	III	D	N/A	3500	4.50	III
	5 (High Head)	6	N/A	3500	4.88	III	F	N/A	3500	4.88	III
	7.5	7	N/A	3500	5.50	IV	G	N/A	3500	5.50	IV
	10	Z	N/A	3500	6.00	IV	H	N/A	3500	6.00	IV

NOTE(S):

a. Pump selections are chiller size dependent.

b. Option Code refers to the Hydronics Option in the model number. See the nomenclature in Fig. 2 for option identification.

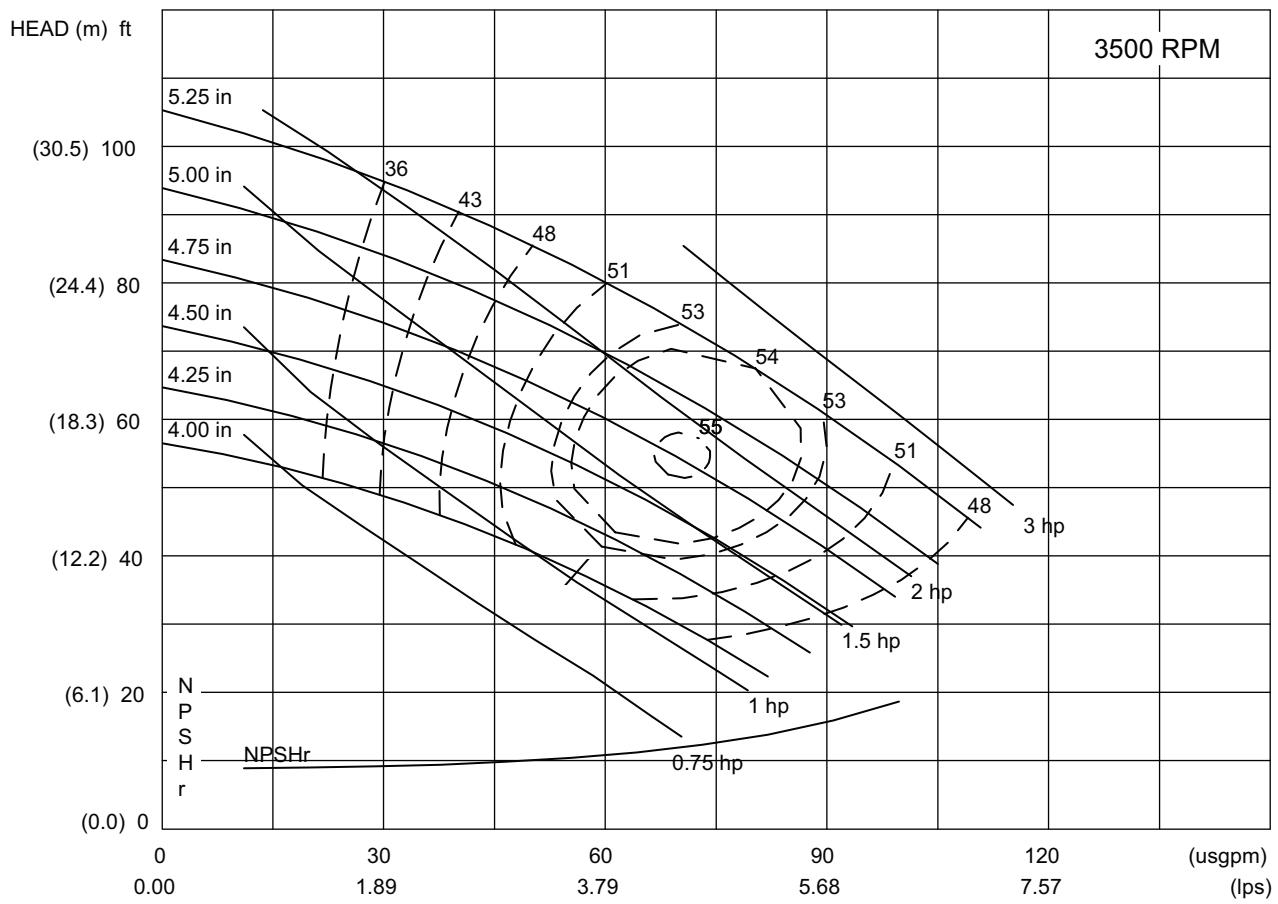
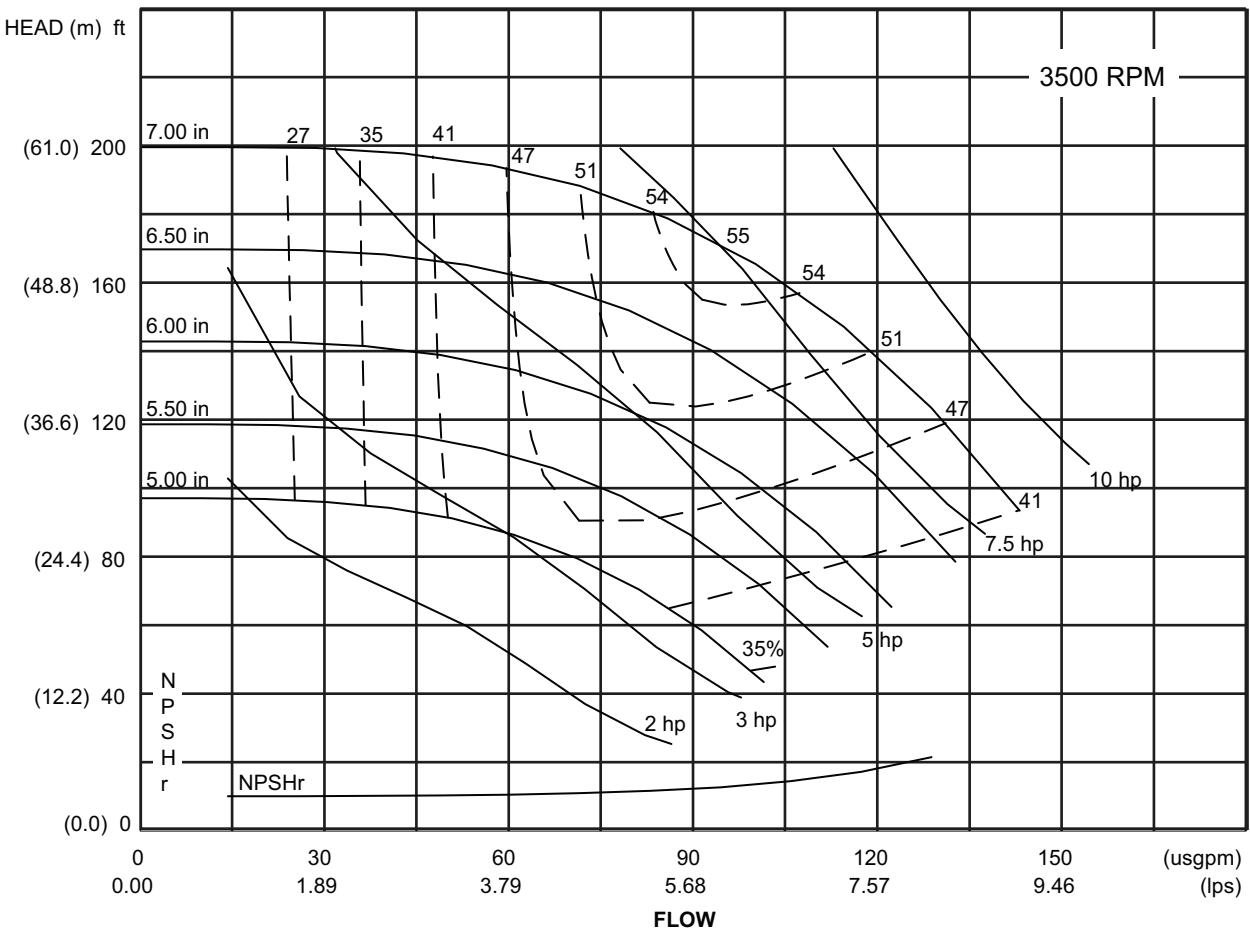


Fig. 23 — Pump Curve I for Hydronic Package, 60 Hz Only — Single Pump 1.5 Hp, Dual Pump 1.5 Hp, Single Pump 3.0 Hp, Dual Pump 3.0 Hp, Single Pump High Head 3.0 Hp, Dual Pump High Head 3.0 Hp — 30RC011-060 Units



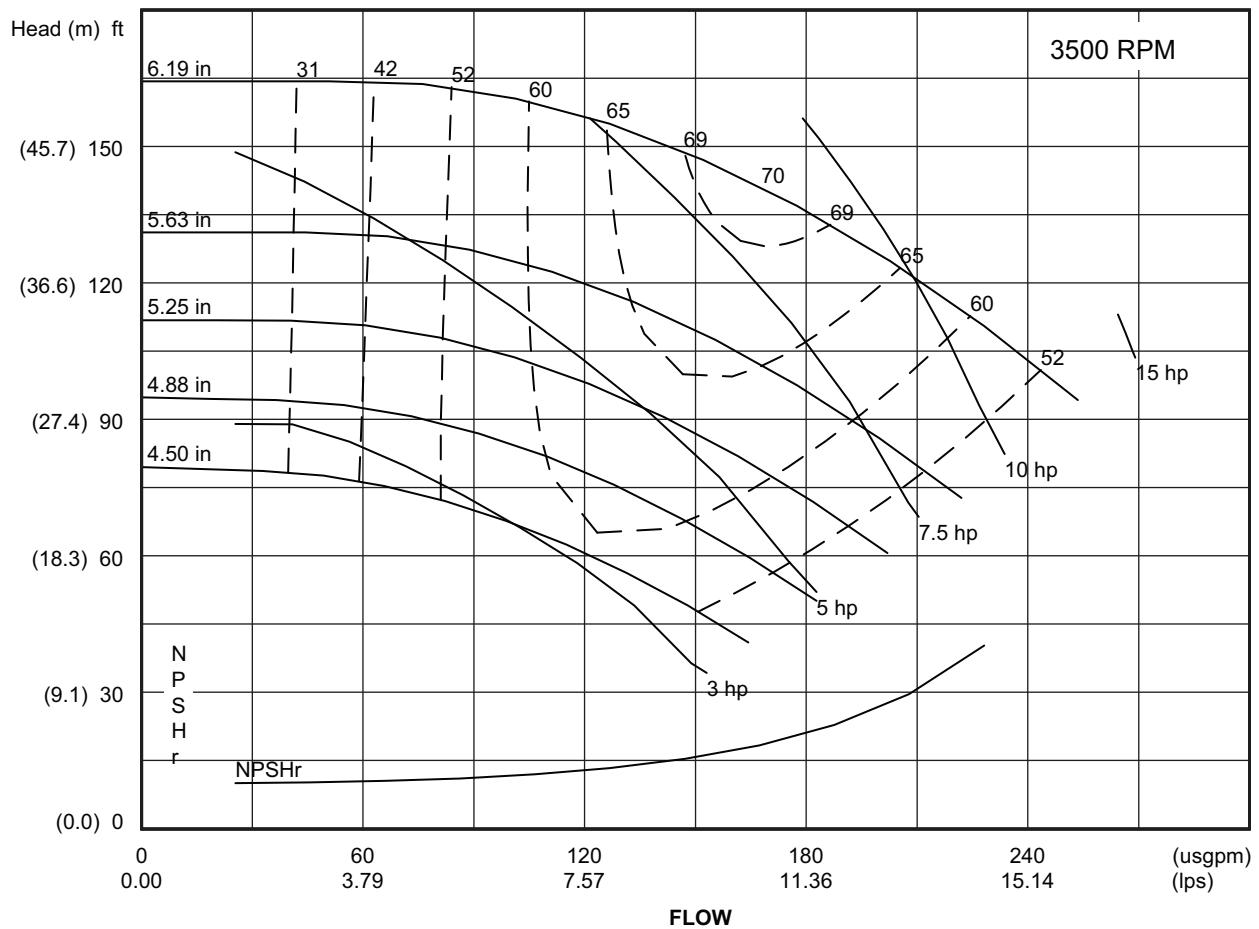
water, specific gravity = 1.00

LEGEND

NPSH_r — Net Pump Suction Head Required

NOTE: Refer to Table 14, "Pump Impeller Sizes (60 Hz Chillers Only)" for proper unit size matching as well as the determination of the impeller diameter.

Fig. 24 — Pump Curve II for Hydronic Package, 60 Hz Only – Single Pump 5.0 Hp, Dual Pump 5.0 Hp – 30RC011-030 Units



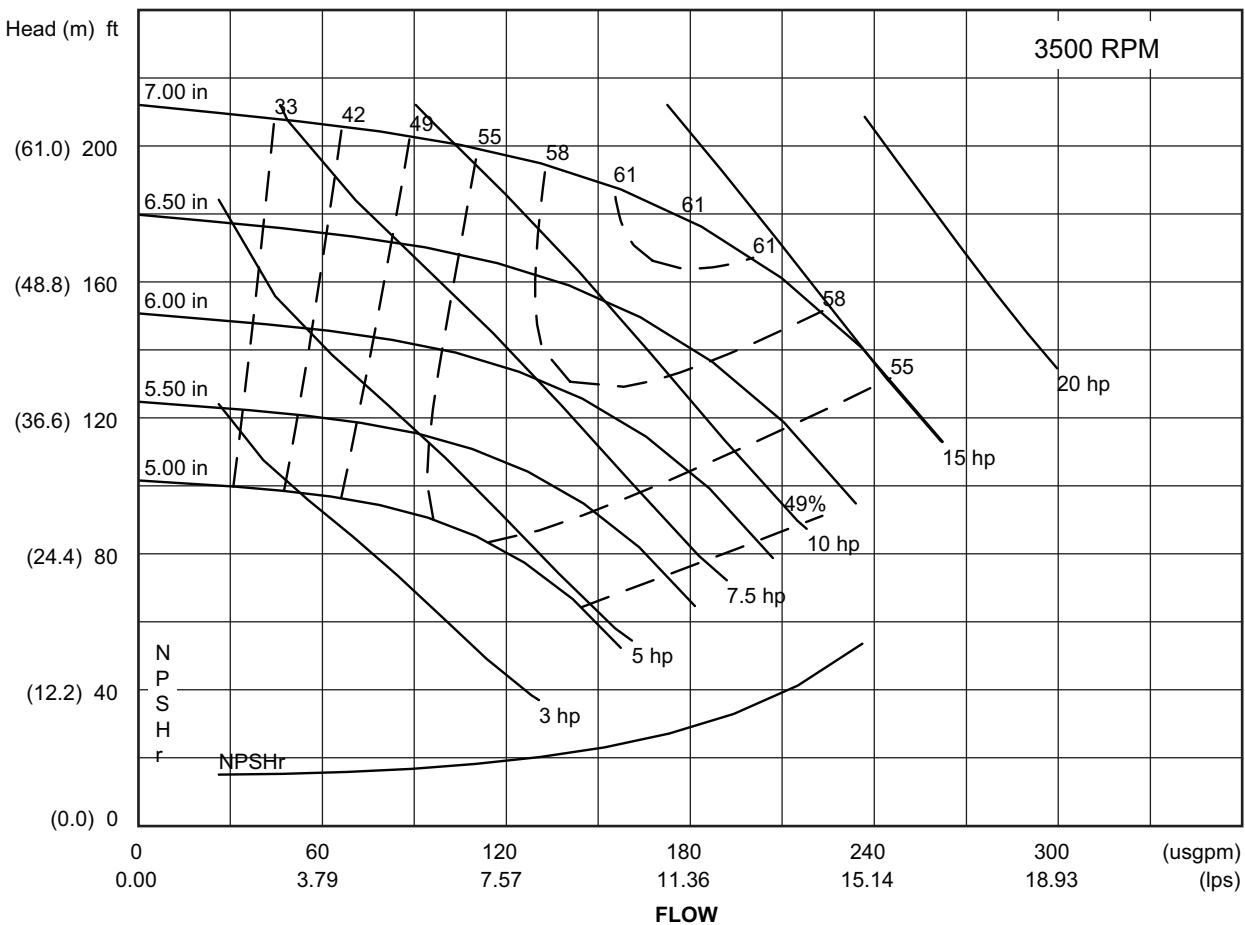
water, specific gravity = 1.00

LEGEND

NPSH_r — Net Pump Suction Head Required

NOTE: Refer to Table 14, "Pump Impeller Sizes (60 Hz Chillers Only)" for proper unit size matching as well as the determination of the impeller diameter.

Fig. 25 — Pump Curve III for Hydronic Package, 60 Hz only — Single Pump 5.0 Hp, Dual Pump 5.0 Hp, Single Pump High Head 5.0 Hp, Dual Pump High Head 5.0 Hp — 30RC035-060 Units



water, specific gravity = 1.00

LEGEND

NPSH_r — Net Pump Suction Head Required

NOTE: Refer to Table 14, "Pump Impeller Sizes (60 Hz Chillers Only)" for proper unit size matching as well as the determination of the impeller diameter.

Fig. 26 — Pump Curve IV for Hydronic Package, 60 Hz only – Single Pump 7.5 Hp, Dual Pump 7.5 Hp, Single Pump 10.0 Hp, Dual Pump 10.0 Hp – 30RC035-060 Units

Table 15 — Balancing Valve Readings — 30RC010-030

2.0 in. SETTING	VALVE COEFFICIENT (C _v)	WATER PRESSURE DROP (ft)									
		GPM									
		5	10	15	20	25	30	35	40	45	50
0.5	8.3	0.8	3.4	7.5	13.4	21.0	30.2	41.1	53.7	67.9	83.8
1.0	10.2	0.6	2.2	5.0	8.9	13.9	20.0	27.2	35.5	45.0	55.5
1.5	13.0	0.3	1.4	3.1	5.5	8.5	12.3	16.7	21.9	27.7	34.2
2.0	16.9	0.2	0.8	1.8	3.2	5.1	7.3	9.9	12.9	16.4	20.2
2.5	20.5	0.1	0.5	1.2	2.2	3.4	4.9	6.7	8.8	11.1	13.7
3.0	25.9	0.1	0.3	0.8	1.4	2.2	3.1	4.2	5.5	7.0	8.6
3.5	29.0	0.1	0.3	0.6	1.1	1.7	2.5	3.4	4.4	5.6	6.9
4.0	35.8	0.0	0.2	0.4	0.7	1.1	1.6	2.2	2.9	3.6	4.5
5.0	37.0	0.0	0.2	0.4	0.7	1.1	1.5	2.1	2.7	3.4	4.2

2.0 in. SETTING	VALVE COEFFICIENT (C _v)	WATER PRESSURE DROP (ft)									
		GPM									
		55	60	65	70	75	80	85	90	95	100
0.5	8.3	101.4	120.7	141.7	164.3	188.6	214.6	242.3	271.6	302.6	335.3
1.0	10.2	67.2	79.9	93.8	108.8	124.9	142.1	160.4	179.8	200.4	222.0
1.5	13.0	41.3	49.2	57.8	67.0	76.9	87.5	98.8	110.7	123.4	136.7
2.0	16.9	24.5	29.1	34.2	39.6	45.5	51.8	58.4	65.5	73.0	80.9
2.5	20.5	16.6	19.8	23.2	26.9	30.9	35.2	39.7	44.5	49.6	55.0
3.0	25.9	10.4	12.4	14.5	16.9	19.4	22.0	24.9	27.9	31.1	34.4
3.5	29.0	8.3	9.9	11.6	13.5	15.5	17.6	19.8	22.2	24.8	27.5
4.0	35.8	5.5	6.5	7.6	8.8	10.1	11.5	13.0	14.6	16.3	18.0
5.0	37.0	5.1	6.1	7.1	8.3	9.5	10.8	12.2	13.7	15.2	16.9

NOTE: See Table 17 for Glycol Correction Factors.

Table 16 — Balancing Valve Readings — 30RC035-060

2.5 in. SETTING	VALVE COEFFICIENT (C _v)	WATER PRESSURE DROP (ft)									
		GPM									
		40	45	50	55	60	65	70	75	80	85
1.0	15.6	15.2	19.2	23.7	28.7	34.2	40.1	46.5	53.4	60.7	68.6
2.0	21.1	8.3	10.5	13.0	15.7	18.7	21.9	25.4	29.2	33.2	37.5
3.0	24.5	6.2	7.8	9.6	11.6	13.9	16.3	18.9	21.6	24.6	27.8
4.0	38.0	2.6	3.2	4.0	4.8	5.8	6.8	7.8	9.0	10.2	11.6
4.5	52.0	1.4	1.7	2.1	2.6	3.1	3.6	4.2	4.8	5.5	6.2
5.0	69.0	0.8	1.0	1.2	1.5	1.7	2.0	2.4	2.7	3.1	3.5

2.5 in. SETTING	VALVE COEFFICIENT (C _v)	WATER PRESSURE DROP (ft)									
		GPM									
		95	100	105	110	115	120	125	130	135	140
1.0	15.6	85.7	94.9	104.7	114.9	125.5	136.7	148.3	160.4	173.0	186.0
2.0	21.1	46.8	51.9	57.2	62.8	68.6	74.7	81.1	87.7	94.6	101.7
3.0	24.5	34.7	38.5	42.4	46.6	50.9	55.4	60.1	65.0	70.1	75.4
4.0	38.0	14.4	16.0	17.6	19.4	21.2	23.0	25.0	27.0	29.2	31.4
4.5	52.0	7.7	8.5	9.4	10.3	11.3	12.3	13.3	14.4	15.6	16.7
5.0	69.0	4.4	4.9	5.3	5.9	6.4	7.0	7.6	8.2	8.8	9.5

2.5 in. SETTING	VALVE COEFFICIENT (C _v)	WATER PRESSURE DROP (ft)									
		GPM									
		150	155	160	165	170	175	180	185	190	195
1.0	15.6	213.6	228.0	243.0	258.4	274.3	290.7	307.5	324.9	342.7	360.9
2.0	21.1	116.7	124.7	132.8	141.3	149.9	158.9	168.1	177.6	187.3	197.3
3.0	24.5	86.6	92.5	98.5	104.8	111.2	117.9	124.7	131.7	138.9	146.3
4.0	38.0	36.0	38.4	41.0	43.6	46.2	49.0	51.8	54.8	57.8	60.8
4.5	52.0	19.2	20.5	21.9	23.3	24.7	26.2	27.7	29.2	30.8	32.5
5.0	69.0	10.9	11.7	12.4	13.2	14.0	14.9	15.7	16.6	17.5	18.4

NOTE: See Table 17 for Glycol Correction Factors.

Table 17 — Glycol Correction Factors

CONCENTRATION	GLYCOL CORRECTION FACTOR			
	Ethylene		Propylene	
	Water Temp —°F (°C)	40 (4.5)	70 (21)	40 (4.5)
0		1.00	1.00	1.00
10		0.99	0.99	0.99
20		0.99	0.99	0.99
30		0.98	0.98	0.99
40		0.97	0.97	0.98
50		0.96	0.96	0.98

NOTES:

1. Glycol Corrections:
2. GPM [actual] = GPM [tested] x Correction Factor

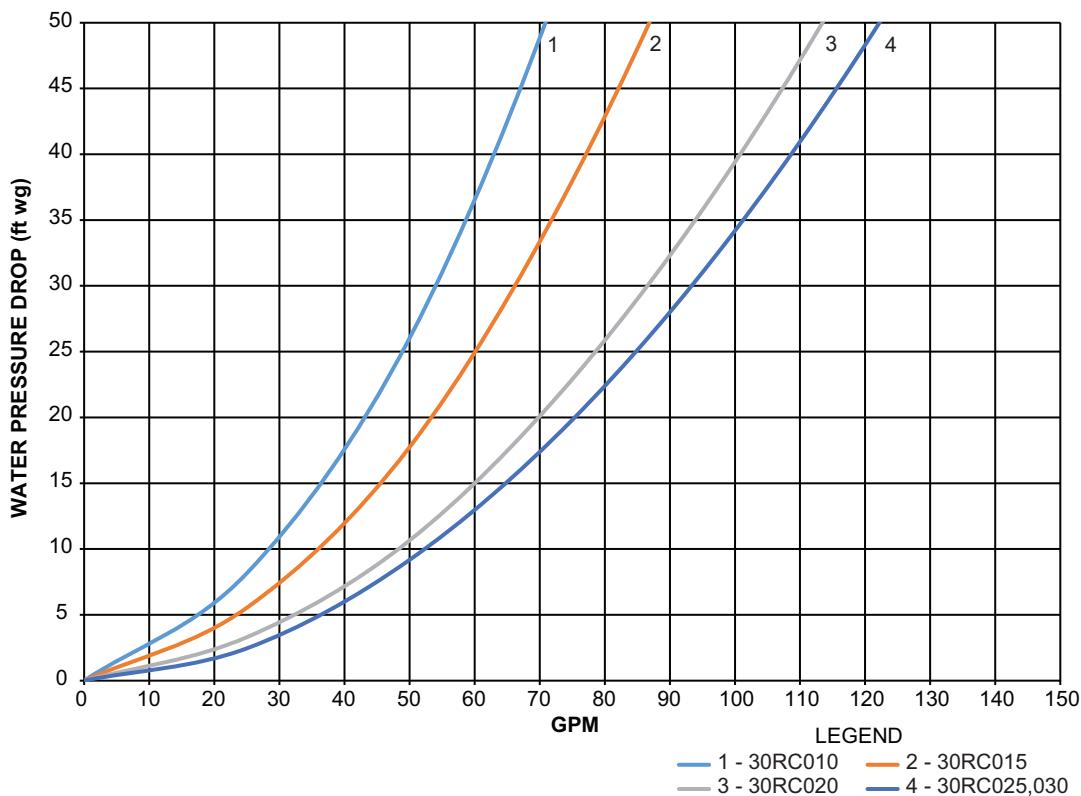


Fig. 27 — Heat Exchanger Pressure Drop (Water Only) — 30RC010-030 (English)

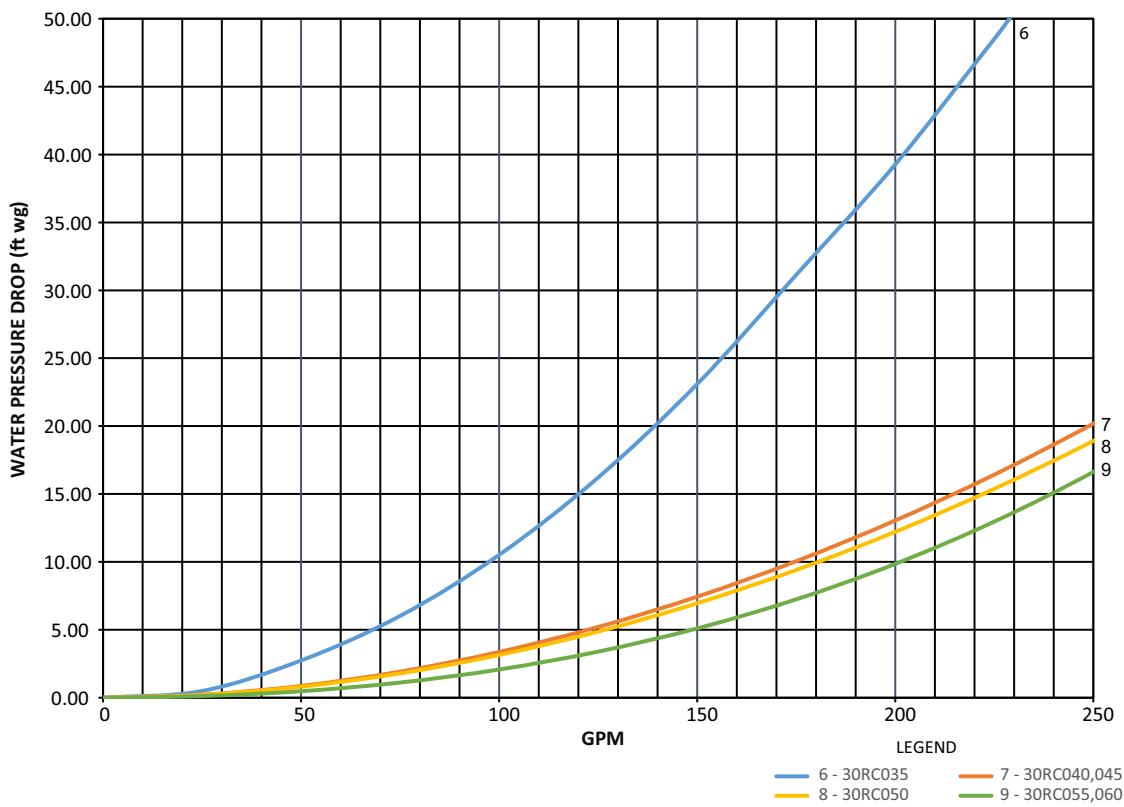


Fig. 28 — Heat Exchanger Pressure Drop (Water Only) — 30RC035-060 (English)

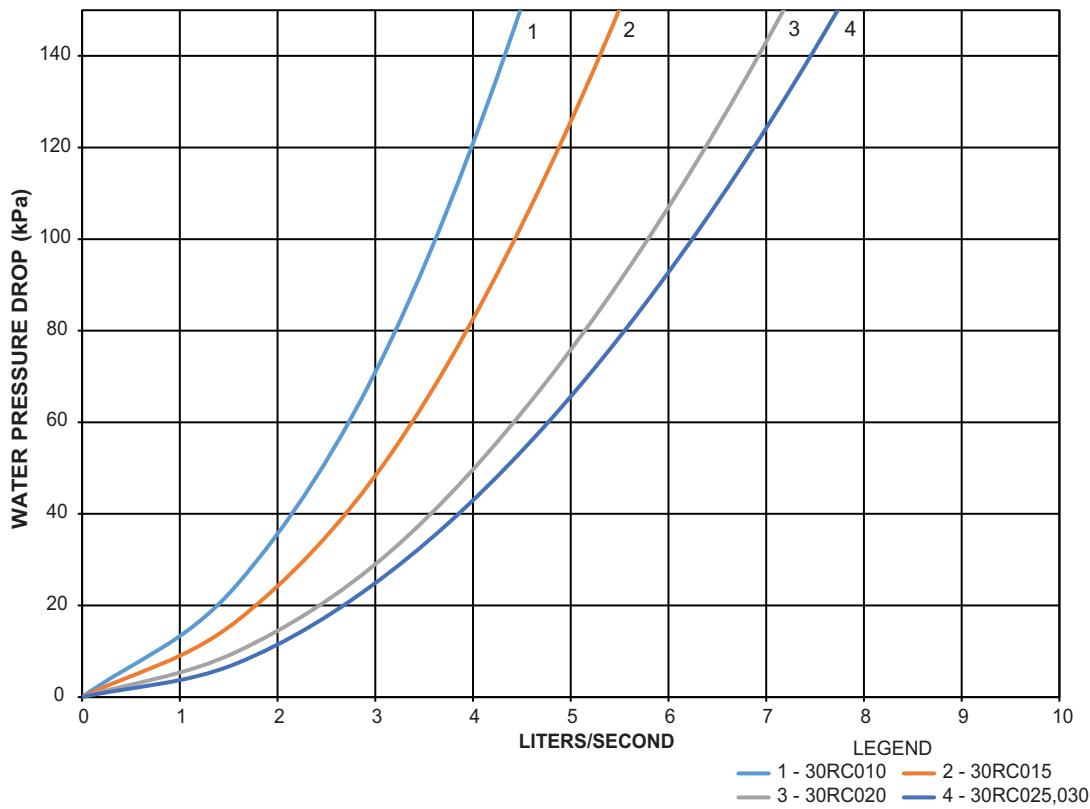


Fig. 29 — Heat Exchanger Pressure Drop (Water Only) — 30RC010-030 (SI)

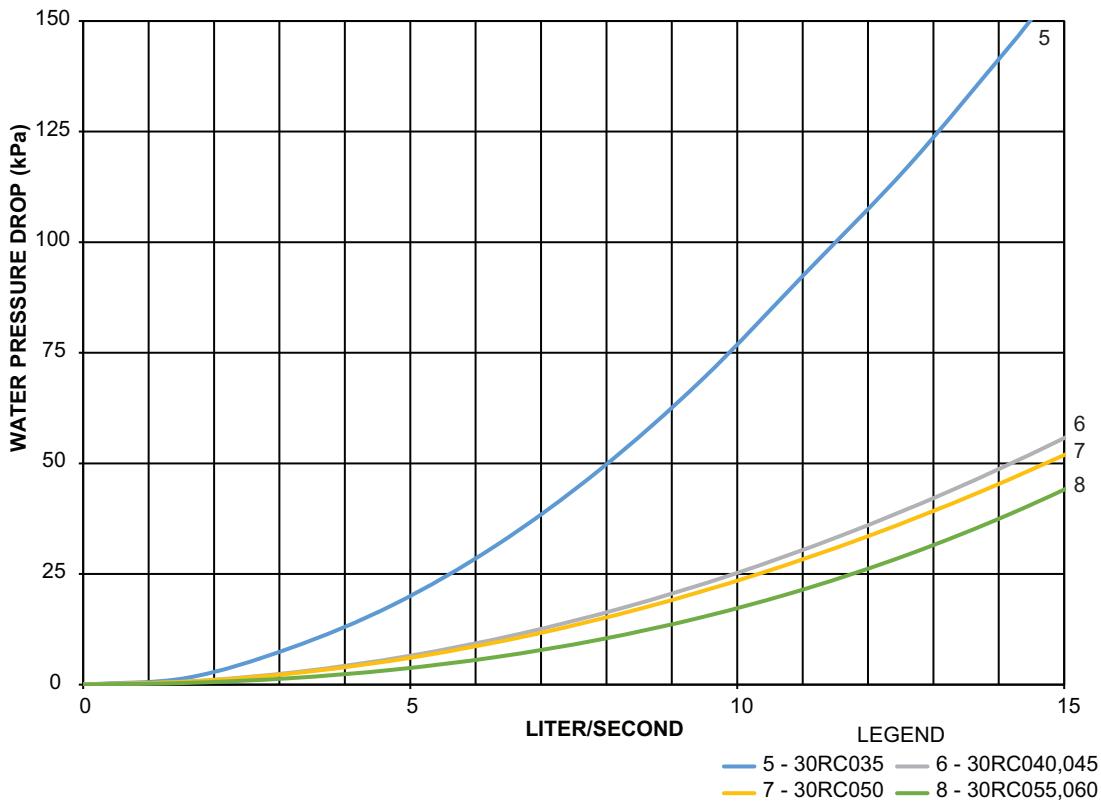


Fig. 30 — Heat Exchanger Pressure Drop (Water Only) — 30RC035-060 (SI)

Minimum Loop Volume

The minimum volume of fluid required to be in circulation is a function of the number of compressors in the chiller as well as the type of application. The minimum fluid in circulation must equal or exceed the values in Table 18.

Table 18 — Minimum Fluid Volume In Circulation

30RC UNIT SIZE	NORMAL AIR CONDITIONING APPLICATION gal./ton (L per kW)			PROCESS COOLING OR LOW AMBIENT OPERATION APPLICATION gal./ton (L per kW)		
	Std Unit	HGBP	Digital	Std Unit	HGBP	Digital
010,015	12 (13.0)	N/A	3 (3.3)	12 (13.0)	N/A	6 (6.5)
030	6 (6.5)	4 (4.3)	3 (3.3)	10 (10.8)	10 (10.8)	6 (6.5)
035-060	3 (3.3)	3 (3.3)	3 (3.3)	6 (6.5)	6 (6.5)	6 (6.5)

LEGEND

HGBP — Hot Gas Bypass

To achieve this fluid volume, it is often necessary to install a tank in the loop. The tank should be baffled to ensure there is no stratification and that water (or suitable inhibited antifreeze solution) entering the tank is adequately mixed with liquid in the tank. See Fig. 31.

The piping between the chiller and the accessory tank can be done to allow the tank to be on the return side of the chiller (tank piped to chiller inlet) or the supply side of the chiller (tank piped to chiller outlet). For standard compressors, it is recommended that the tank be piped to the return side of the chiller to buffer any changes in load to allow more stable chiller operation. For digital compressor applications, it is recommended that the tank be piped to the supply side of the chiller to provide a more stable supply temperature.

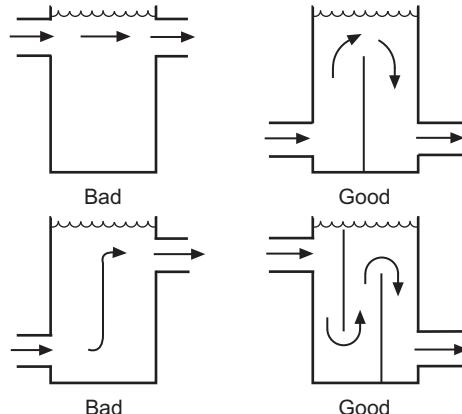


Fig. 31 — Tank Baffling

A properly baffled storage tank is available from the factory as an accessory for sizes 010-060 only. These tanks are designed to physically fit beneath the corresponding 30RC unit, taking up the same footprint.

- 30RC010, 015 83 gallons (314 liters)
- 30RC030 119 gallons (450 liters)
- 30RC035-060 241 gallons (912 liters)

Storage tank weight (water weight included) is as follows:

- 30RC010, 015 1673 lb (759 kg)
- 30RC030 2193 lb (995 kg)
- 30RC035-060 4361 lb (1978 kg)

Maximum Loop Volume (Units with Hydronic Package)

Since the minimum size of the expansion tank is dependent upon loop volume, units with the integrated hydronic kit must not exceed the maximum loop volume limits (see Table 19). The limits are dependent on the maximum and minimum temperatures of the water, the maximum and minimum pressures seen by the expansion tank, and the heat transfer fluid. Expansion tank and maximum loop volume data is as follows:

	30RC010-030	30RC035-060
Volume gal. (L)	5.0 (18.9)	10.0 (37.9)
Acceptance Volume gal. (L)	2.9 (11.0)	5.5 (20.8)

Table 19 — Maximum Loop Volume

CONCENTRATION	30RC010-030		30RC035-060	
	GAL.	L	GAL.	L
PURE WATER	230	871	738	2793
10% EG	132	500	425	1609
20% EG	123	466	394	1491
30% EG	114	431	366	1385
40% EG	107	405	342	1294
10% PG	124	469	399	1510
20% PG	106	401	339	1283
30% PG	93	352	298	1128
40% PG	83	314	267	1011

LEGEND

EG — Ethylene Glycol
PG — Propylene Glycol

NOTE:

1. Maximum loop volume is based on typical system of 12 psig (83 kPa) and 30 psig (207 kPa) of min/max pressures, and 38°F (3.3°C) and 100°F (37.8°C) min/max water temperature.
2. If the volume in the system is greater than the limits listed, then extra expansion tank volume must be added to the system.

Pump Modification/Trimming (Units with Factory-Installed Hydronic Package)

Since the pumps are constant speed, the only way to obtain greater flow with a given pump/impeller is to decrease system head. This will allow the pump to "ride" its curve to the right, resulting in increased flow. If greater flow is necessary, look at opening the balance valve. Also, verify that the strainer is clean, and that no unnecessary system resistance is present, such as partially closed isolation valves.

Increasing system resistance by closing the balancing valve will force the pump to "ride" its curve to the left, resulting in less flow. Although this does reduce power consumption slightly, it may not be the desirable method of reducing the flow, especially if a rather large reduction is needed.

The other method for reducing flow on a constant speed pump is impeller trimming. The impellers in the pumps provided in the 30RC hydronic kit are easily removable for this purpose. Refer to the pump literature packet supplied with the hydronic package information on Seal Replacement in the Service Section, and follow its instructions for impeller removal. Trimming should only be done by a qualified machine shop that has experience in this operation. Contact your local Carrier representative for a recommended machine shop. After trimming, the impeller MUST be balanced. Failure to balance trimmed impellers can result in excessive vibration, noise, and premature bearing failure. Impeller trimming has the added benefit of maximum bhp savings.

PUMP VFD

Dual pump hydronic packages may be ordered with a variable frequency drive (VFD) for speed control.

SENSORLESS CONTROL (CLOSED LOOP) — ACTIVE SETUP 1

The VFD provided with the pumps from the factory is configured for sensorless control. Default set points are entered for the unit according to nominal tonnage of the unit. Table 20 shows the settings from the factory. For details on operating the drive display, see the pump installation and operation manual, and for more detailed information on the drive, see IVS 102 Operating Instructions. These manuals are supplied in the control box of the chiller.

The following set points should be verified or modified for the actual installation.

Parameter 20-21 Setpoint, Hd, Ft-Wc

Parameter 22-89 Design Flow Setpoint, gpm

Parameter 22-87 Pressure at no-flow speed, Hmin, Ft-Wc (40% of Hd)

When changing set points, assure values are within the pump curve for the pump provided with the unit.

Minimum speed for the pump is set at 50 Hz, Parameter 4-12. This may be changed as long as the corresponding flow rate meets the minimum flow requirement for the chiller.

REMOTE SENSOR (CLOSED LOOP) — ACTIVE SETUP 2

The drive may be set up to use a remote sensor instead of sensorless pump control. For a remote sensor control, change Active Set-up on the drive from 1 to 2, Parameter 0-10. The drive will read a 0-10 vdc or a 0/4-20 mA signal from the sensor. Switch S2-01 must be set to Off (default setting) for 0-10 vdc or On for 0/4-20 mA. The switch is located behind the display. The cover must be removed and the display will snap off to access this switch.

The set point is defined by Parameter 20-21, Setpoint 1. This is a percentage of the maximum signal from the sensor. The default is 80%.

Table 20 — Default Settings for Sensorless Control — Setup 1

UNIT SIZE (TONS)			20-30		35-45			50-60			
Pump			1.25B	1.5D	1.25B	4380 2x2x6	2D	1.25B	4380 2x2x6	2D	2D
Hp			3	5	3	5	7.5	3	5	7.5	10
Param. ^a	Desc.		5	5.5	5.25	4.88	5.5	5.25	4.88	5.5	6
20-21	Setpoint 1	Hd	ft wc	70	100	50	70	70	50	60	80
22-89	Flow at Design Point		gpm	48		96			100	130	
22-87	Press. at No Flow Speed	40% Hd	ft wc	28	40	20	28	28	20	24	32

NOTE(S):

a. Common parameters:

Parameter	Setting	Units	Description
4-12	50	Hz	Minimum Speed
5-40	6		Function Rely - running/no warning

REMOTE CONTROLLER (OPEN LOOP) — ACTIVE SETUP 3

Drive may be controlled by external sources. For a remote control of the drive, change Active Setup on the drive to 3, Parameter 0-10. An input signal can be used to control the drive speed. Input signal may be 0-10 vdc or 0/4-20 mA. The setup is the same as a remote sensor.

A BACnet^{TM1} card is also included with the drive. For BACnet, use Setup 3. The communication settings are in section 8 of the drive parameters. See drive manual for details.

PREPARATION FOR YEAR-ROUND OPERATION

If the unit is in operation year-round, add sufficient suitable inhibited antifreeze solution such as propylene or ethylene glycol to chilled water to prevent freezing under low-ambient temperature operating conditions. Consult a local water treatment specialist on characteristics of water and recommended inhibitor.

IMPORTANT: Glycol antifreeze solutions are highly recommended since heater tapes provide no protection in the event of a power failure.

High efficiency variable condenser fans are required if ambient temperatures are below 45°F (7°C) on size 020-030 units, and 32°F (0°C) on size 035-060 units.

Accessory wind baffles are required with high-efficiency variable condenser fans if the wind velocity is anticipated to be greater than 5 mph (8 km/h). Unit sizes 010-030 require one baffle and unit sizes 035-060 require two baffles. See Table 21.

Table 21 — Wind Baffle Accessory Quantities

ACCESSORY PART NO. 30RA-900---	UNIT SIZE 30RC				
	010, 015	020	025, 030	035, 040	045-060
064	1	—	—	—	—
065	—	1	—	2	—
066	—	—	1	—	2

⚠ CAUTION

To avoid damage to refrigerant coils and electronic components, use extreme care when drilling screw holes and attaching fasteners.

FREEZE PROTECTION

The 30RC units are provided with a water strainer and a flow switch to protect against freezing situations that occur from no water flow. While the flow switch (thermal dispersion) is helpful in preventing freezing during no-flow situations, it does not protect the chiller in case of power failure, or in other cases where water temperature falls below the freezing mark. Appropriate concentrations of inhibited glycol or other suitable inhibited antifreeze solution should be considered for chiller protection where ambient temperatures are expected to fall below 32°F (0.0°C). Consult local water treatment specialist on characteristics of the system water and add a recommended inhibitor to the chilled water.

⚠ CAUTION

Do not circulate water through unit without strainer in place. Failure to use the strainer represents abuse and may impair or otherwise negatively affect the Carrier product warranty.

1. If the pump will be subjected to freezing temperatures, steps must be taken to prevent freeze damage. If the pump will not be used during this time, it is recommended to drain the pump and hydronic package and back-flush these components with inhibited glycol. Otherwise, a glycol-water solution should be considered as the heat transfer fluid. Units have a drain mounted on the piping leaving the heat exchanger. Drains are located on the sheet metal base of all units.

NOTE: Do not use automobile antifreeze, or any other fluid that is not approved for heat exchanger duty. Use only appropriately inhibited glycols, concentrated to provide adequate protection for the temperature considered.

2. Use an electric tape heater for the internal piping if unit will be exposed to freezing temperature.
3. Ensure that power is available to the chiller at all times, even during the off-season, so that the pump and evaporator heaters have power. Also make sure that the piping tape heaters have power.
4. On units with pump packages, a heater is supplied that will protect this section from freezing in outdoor-air temperatures down to -20°F (-29°C), except in case of a power failure.
5. Evaporator heaters that will protect down to -20°F (-29°C) can be installed as a factory option. It should be noted that these heaters will not protect the evaporator from freezing in the event of a power failure.

PREPARATION FOR WINTER SHUTDOWN

If the unit is not operational during the winter months, at the end of the cooling season complete the following steps.

⚠ CAUTION

Failure to remove power before draining heater-equipped evaporators and hydronic packages can result in heater tape and insulation damage.

1. If the evaporator/pump will not be drained, do not shut off power during off-season shutdown. If the evaporator/pump is drained, open the circuit breaker for the heater or shut off power during off-season shutdown.
2. Drain water from the system.
3. Replace drain plug(s) and add sufficient inhibited glycol (or other suitable inhibited antifreeze) to evaporator, pump, and piping to prevent freezing of residual water.
4. At the beginning of the next cooling season, refill evaporator and add recommended inhibitor.

Step 5 — Make Electrical Connections

⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

POWER SUPPLY

Electrical characteristics of available power supply must agree with unit nameplate rating. Field wiring size must be within limits shown in Table 22. See Tables 23-29 for component electrical data.

IMPORTANT: Operating unit on improper supply voltage or with excessive phase imbalance constitutes abuse and may affect Carrier warranty.

1. Third-party trademarks and logos are the property of their respective owners.

POWER WIRING

All power wiring must comply with applicable local and national codes. Install field-supplied branch circuit fused disconnect per NEC (National Electric Code) of a type that can be locked OFF or ON. Disconnect must be within sight from and readily accessible from unit in compliance with NEC Article 440-14.

General Wiring Notes

1. The control circuit does NOT require a separate power source. Control circuit power is obtained by a step-down transformer from the main three-phase power supply. The TB5 and TB6 (EMM) terminal strip is provided for field-wired control devices.
2. Evaporator and pump heaters (if factory installed) are wired in the control circuit so they are operable as long as the main power supply to the unit and heater safety device is ON. A factory-installed fuse protects them.
3. Power is at one end only.

4. All field power enters the unit through a hole located in the corner post of the unit or the bottom of the control box shelf. Refer to Fig. 32 for field wiring details. Refer to Fig. 5-11 for exact location of field power entry. Be sure to seal entering power wire conduit per NEC requirements.
5. Maximum field wire sizes allowed by lugs on terminal block/non-fused disconnect are listed in Table 22.
6. Terminals for field power supply are suitable for copper conductors. Insulation must be rated 167°F (75°C) minimum.
7. Units with high short circuit ratings and terminal block option require that specific fuses be applied to achieve this rating. Refer to Table 22.
8. Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Table 22 — Field Wiring Sizes^a

CONNECTION TYPE	30RC UNIT SIZES	MCA RANGE	WIRE SIZE RANGE	MAXIMUM NUMBER OF WIRES PER PHASE	HIGH SCCR FUSE TYPE ^b
TERMINAL BLOCK	010-060	MCA up to 175	14 AWG to 2/0 AWG	1	J, T, RK1, RK5, G, CC
		MCA 175.1 to 420	2 AWG to 600 kcmil	1	J, T, RK1, RK5, G, CC
NON-FUSED DISCONNECT	All	MCA up to 125	14 AWG to 3/0 AWG	1	—
	All	MCA 125.1 to 225	4 AWG to 4/0	1	—
	All	MCA 225.1 to 400	2/0 AWG to 500 kcmil	1	—
	All		2/0 AWG to 250 kcmil	2	—

NOTE(S):

- a. Wiring for main field supply must be rated 75°C. Use copper conductors only.
- b. Units with high SCCR option and terminal block must use approved fuses to meet high SCCR rating.

LEGEND

AWG	— American Wire Gauge
MCA	— Minimum Circuit Amps
SCCR	— Short Circuit Current Rating

Table 23 – 30RC Single Point Power - Standard Compressor^{a,b,c}

UNIT 30RC	UNIT VOLTAGE				NO. OF COND FANS	NO HYDRONIC PACKAGE				
	V(3 Ph)	Hz	Supplied			MCA	MOCP	ICF	REC FUSE SIZE	
			Min	Max						
010	208/230	60	187	253	1	48.5	70	188	60	
	380	60	342	418	1	27.1	35	107	30	
	460	60	414	506	1	25.3	35	86	30	
	575	60	518	633	1	17.8	20	63	20	
015	208/230	60	187	253	1	67.0	90	293	80	
	380	60	342	418	1	40.6	60	188	50	
	460	60	414	506	1	33.0	45	145	40	
	575	60	518	633	1	24.1	35	103	30	
020	208/230	60	187	253	2	92.6	125	313	110	
	380	60	342	418	2	52.1	70	200	60	
	460	60	414	506	2	43.4	60	163	50	
	575	60	518	633	2	32.8	45	125	40	
025	208/230	60	187	253	2	128.4	175	399	150	
	380	60	342	418	2	68.7	90	204	80	
	460	60	414	506	2	56.7	70	169	70	
	575	60	518	633	2	45.3	60	136	50	
030	208/230	60	187	253	2	135.4	175	453	150	
	380	60	342	418	2	78.7	110	265	90	
	460	60	414	506	2	65.2	90	214	80	
	575	60	518	633	2	51.6	70	171	60	
035	208/230	60	187	253	3	161.5	175	382	175	
	380	60	342	418	3	96.6	110	244	110	
	460	60	414	506	3	75.7	90	195	80	
	575	60	518	633	3	58.5	70	151	70	
040	208/230	60	187	253	3	188.3	225	427	200	
	380	60	342	418	3	110.3	125	254	125	
	460	60	414	506	3	91.4	110	211	100	
	575	60	518	633	3	71.6	80	167	80	
045	208/230	60	187	253	3	222.0	250	493	250	
	380	60	342	418	3	125.2	150	268	150	
	460	60	414	506	3	103.4	125	222	110	
	575	60	518	633	3	82.8	100	178	90	
050	208/230	60	187	253	3	237.8	250	509	250	
	380	60	342	418	3	126.7	150	262	150	
	460	60	414	506	3	104.8	125	218	125	
	575	60	518	633	3	83.8	100	174	90	
055	208/230	60	187	253	4	250.9	300	569	300	
	380	60	342	418	4	140.6	150	327	150	
	460	60	414	506	4	116.2	125	265	125	
	575	60	518	633	4	92.5	110	212	100	
060	208/230	60	187	253	4	257.2	300	575	300	
	380	60	342	418	4	149.5	175	336	175	
	460	60	414	506	4	123.8	150	273	150	
	575	60	518	633	4	98.1	110	218	110	

NOTE(S):

- a. Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
- b. All units/modules have single point primary power connection. (Each unit/module requires its own power supply.) Main power must be supplied from a field-supplied disconnect.
- c. Evaporator heater is wired into the control circuit so it is always operable as long as the power supply disconnect and heater safety device are on.

LEGEND

ICF — Instantaneous Current Flow
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection



Table 23 – 30RC Single Point Power - Standard Compressor^{a,b,c} (cont)

UNIT 30RC	UNIT VOLTAGE	SINGLE 1.5 HP PUMP, 3600 RPM				SINGLE 3.0HP PUMP, 3600 RPM				SINGLE 5.0HP PUMP, 3600 RPM			
	V(3 Ph)	MCA	MOCP	ICF	REC FUSE SIZE	MCA	MOCP	ICF	REC FUSE SIZE	MCA	MOCP	ICF	REC FUSE SIZE
010	208/230	52.8	70	192	60	56.4	70	195	70	61.1	80	200	70
	380	29.5	40	109	35	31.5	40	111	35	34.1	45	114	40
	460	27.4	35	88	35	29.0	40	89	35	31.1	40	91	35
	575	19.4	25	64	25	20.8	25	66	25	22.4	25	67	25
015	208/230	71.3	100	297	80	74.9	100	301	90	79.6	110	305	90
	380	43.0	60	191	50	45.0	60	193	60	47.6	60	195	60
	460	35.1	45	147	40	36.7	50	148	45	38.8	50	150	45
	575	25.7	35	105	30	27.1	35	106	35	28.7	40	108	35
020	208/230	96.9	125	317	110	100.5	125	321	110	105.2	125	325	125
	380	54.5	70	203	60	56.5	70	205	70	59.1	70	207	70
	460	45.5	60	165	50	47.1	60	166	60	49.2	60	168	60
	575	34.4	45	126	40	35.8	45	128	40	37.4	45	129	45
025	208/230	132.7	175	404	150	136.3	175	407	150	141.0	175	412	175
	380	71.1	90	206	80	73.1	100	208	80	75.7	100	211	90
	460	58.8	80	172	70	60.4	80	173	70	62.5	80	175	70
	575	46.9	60	137	60	48.3	60	139	60	49.9	60	140	60
030	208/230	139.7	175	457	175	143.3	175	461	175	148.0	200	466	175
	380	81.1	110	268	90	83.1	110	270	100	85.7	110	272	100
	460	67.3	90	216	80	68.9	90	218	80	71.0	90	220	80
	575	53.2	70	173	60	54.6	70	174	60	56.2	70	176	70
035	208/230	—	—	—	—	169.4	200	390	200	174.1	200	394	200
	380	—	—	—	—	101.0	110	249	110	103.6	110	251	110
	460	—	—	—	—	79.4	90	199	90	81.5	90	201	90
	575	—	—	—	—	61.5	70	154	70	63.1	70	155	70
040	208/230	—	—	—	—	196.2	225	435	225	200.9	225	440	225
	380	—	—	—	—	114.7	125	258	125	117.3	125	261	125
	460	—	—	—	—	95.1	110	215	110	97.2	110	217	110
	575	—	—	—	—	74.6	90	170	80	76.2	90	172	90
045	208/230	—	—	—	—	229.9	250	501	250	234.6	250	505	250
	380	—	—	—	—	129.6	150	272	150	132.2	150	275	150
	460	—	—	—	—	107.1	125	226	125	109.2	125	228	125
	575	—	—	—	—	85.8	100	181	100	87.4	100	182	100
050	208/230	—	—	—	—	245.7	250	517	250	250.4	300	521	300
	380	—	—	—	—	131.1	150	266	150	133.7	150	269	150
	460	—	—	—	—	108.5	125	221	125	110.6	125	223	125
	575	—	—	—	—	86.8	100	177	100	88.4	100	179	100
055	208/230	—	—	—	—	258.8	300	576	300	263.5	300	581	300
	380	—	—	—	—	145.0	175	332	175	147.6	175	334	175
	460	—	—	—	—	119.9	125	269	125	122.0	125	271	125
	575	—	—	—	—	95.5	110	215	110	97.1	110	217	110
060	208/230	—	—	—	—	265.1	300	583	300	269.8	300	587	300
	380	—	—	—	—	153.9	175	341	175	156.5	175	343	175
	460	—	—	—	—	127.5	150	277	150	129.6	150	279	150
	575	—	—	—	—	101.1	110	221	110	102.7	110	222	110

NOTE(S):

- Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
- All units/modules have single point primary power connection. (Each unit/module requires its own power supply.) Main power must be supplied from a field-supplied disconnect.
- Evaporator heater is wired into the control circuit so it is always operable as long as the power supply disconnect and heater safety device are on.

LEGEND

ICF — Instantaneous Current Flow
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection



Table 23 — 30RC Single Point Power - Standard Compressor^{a,b,c} (cont)

UNIT 30RC	UNIT VOLTAGE V(3 Ph)	SINGLE 7.5 HP PUMP, 3600 RPM				SINGLE 10 HP PUMP, 3600 RPM			
		MCA	MOCP	ICF	REC FUSE SIZE	MCA	MOCP	ICF	REC FUSE SIZE
010	208/230	—	—	—	—	—	—	—	—
	380	—	—	—	—	—	—	—	—
	460	—	—	—	—	—	—	—	—
	575	—	—	—	—	—	—	—	—
015	208/230	—	—	—	—	—	—	—	—
	380	—	—	—	—	—	—	—	—
	460	—	—	—	—	—	—	—	—
	575	—	—	—	—	—	—	—	—
020	208/230	—	—	—	—	—	—	—	—
	380	—	—	—	—	—	—	—	—
	460	—	—	—	—	—	—	—	—
	575	—	—	—	—	—	—	—	—
025	208/230	—	—	—	—	—	—	—	—
	380	—	—	—	—	—	—	—	—
	460	—	—	—	—	—	—	—	—
	575	—	—	—	—	—	—	—	—
030	208/230	—	—	—	—	—	—	—	—
	380	—	—	—	—	—	—	—	—
	460	—	—	—	—	—	—	—	—
	575	—	—	—	—	—	—	—	—
035	208/230	180.0	200	388	200	186.5	200	395	200
	380	107.0	125	247	125	110.6	125	250	125
	460	84.4	100	198	90	87.2	100	201	100
	575	65.5	70	153	70	67.7	80	155	80
040	208/230	206.8	250	434	225	213.3	250	440	225
	380	120.7	125	256	125	124.3	150	260	150
	460	100.1	110	214	110	102.9	110	217	110
	575	78.6	90	169	90	80.8	90	172	90
045	208/230	240.5	250	505	250	247.0	250	512	250
	380	135.6	150	274	150	139.2	150	278	150
	460	112.1	125	228	125	114.9	125	231	125
	575	89.8	100	182	100	92.0	110	185	100
050	208/230	256.3	300	521	300	262.8	300	528	300
	380	137.1	150	269	150	140.7	150	272	150
	460	113.5	125	223	125	116.3	125	226	125
	575	90.8	100	179	100	93.0	110	181	100
055	208/230	269.4	300	575	300	275.9	300	582	300
	380	151.0	175	330	175	154.6	175	333	175
	460	124.9	150	268	150	127.7	150	271	150
	575	99.5	110	214	110	101.7	110	216	110
060	208/230	275.7	300	587	300	282.2	300	594	300
	380	159.9	175	343	175	163.5	175	346	175
	460	132.5	150	279	150	135.3	150	281	150
	575	105.1	125	222	125	107.3	125	224	125

NOTE(S):

- a. Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
- b. All units/modules have single point primary power connection. (Each unit/module requires its own power supply.) Main power must be supplied from a field-supplied disconnect.
- c. Evaporator heater is wired into the control circuit so it is always operable as long as the power supply disconnect and heater safety device are on.

LEGEND

ICF — Instantaneous Current Flow
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection



Table 24 – 30RC Single Point Power - Digital Compressor^{a,b,c}

UNIT 30RC	UNIT VOLTAGE				NUMBER OF COND FANS	NO HYDRONIC PACKAGE				
	V(3 Ph)	Hz	Supplied			MCA	MOCP	ICF	REC FUSE SIZE	
			Min	Max						
010	208/230	60	187	253	1	51.0	70	185	60	
	380	60	342	418	1	27.2	35	92	35	
	460	60	414	506	1	25.3	35	86	30	
	575	60	518	633	1	17.4	20	63	20	
015	208/230	60	187	253	1	66.8	90	268	80	
	380	60	342	418	1	38.4	50	150	45	
	460	60	414	506	1	33.4	45	145	40	
	575	60	518	633	1	23.9	35	103	30	
020	208/230	60	187	253	2	90.6	125	311	100	
	380	60	342	418	2	52.8	70	200	60	
	460	60	414	506	2	44.2	60	163	50	
	575	60	518	633	2	33.9	45	125	40	
025	208/230	60	187	253	2	126.4	175	397	150	
	380	60	342	418	2	69.5	90	204	80	
	460	60	414	506	2	58.8	80	178	70	
	575	60	518	633	2	47.3	60	136	60	
030	208/230	60	187	253	2	143.5	200	453	175	
	380	60	342	418	2	77.3	100	264	90	
	460	60	414	506	2	65.5	90	214	80	
	575	60	518	633	2	55.6	70	171	70	
035	208/230	60	187	253	3	159.5	175	380	175	
	380	60	342	418	3	97.1	110	245	110	
	460	60	414	506	3	76.5	90	195	90	
	575	60	518	633	3	59.6	70	151	70	
040	208/230	60	187	253	3	193.9	225	427	225	
	380	60	342	418	3	106.9	125	250	125	
	460	60	414	506	3	90.1	110	210	100	
	575	60	518	633	3	69.5	80	165	80	
045	208/230	60	187	253	3	226.5	250	497	250	
	380	60	342	418	3	121.8	125	264	125	
	460	60	414	506	3	102.1	110	221	110	
	575	60	518	633	3	80.7	90	176	90	
050	208/230	60	187	253	3	235.9	250	507	250	
	380	60	342	418	3	127.5	150	262	150	
	460	60	414	506	3	106.9	125	227	125	
	575	60	518	633	3	85.7	100	174	100	
055	208/230	60	187	253	4	249.0	300	567	300	
	380	60	342	418	4	141.3	150	328	150	
	460	60	414	506	4	117.9	125	267	125	
	575	60	518	633	4	94.1	110	214	100	
060	208/230	60	187	253	4	265.2	300	575	300	
	380	60	342	418	4	148.1	175	335	175	
	460	60	414	506	4	124.1	150	273	150	
	575	60	518	633	4	102.0	125	218	110	

NOTE(S):

- Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
- All units/modules have single point primary power connection. (Each unit/module requires its own power supply.) Main power must be supplied from a field-supplied disconnect.
- Evaporator heater is wired into the control circuit so it is always operable as long as the power supply disconnect and heater safety device are on.

LEGEND

ICF — Instantaneous Current Flow
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection



Table 24 — 30RC Single Point Power - Digital Compressor^{a,b,c} (cont)

UNIT 30RC	UNIT VOLTAGE	SINGLE 1.5 HP PUMP, 3600 RPM				SINGLE 3.0 HP PUMP, 3600 RPM				SINGLE 5.0 HP PUMP, 3600 RPM			
		V(3 Ph)	MCA	MOCP	ICF	REC FUSE SIZE	MCA	MOCP	ICF	REC FUSE SIZE	MCA	MOCP	ICF
010	208/230	55.3	70			58.9	80			63.6	80		
	380	29.6	40	94	35	31.6	40	96	35	34.2	45	99	40
	460	27.4	35	88	35	29.0	40	89	35	31.1	40	91	35
	575	19.0	25	64	25	20.4	25	66	25	22.0	25	67	25
015	208/230	71.1	100	272	80	74.7	100	276	90	79.4	110	280	90
	380	40.8	50	153	50	42.8	60	155	50	45.4	60	157	60
	460	35.5	50	147	40	37.1	50	148	45	39.2	50	150	45
	575	25.5	35	105	30	26.9	35	106	30	28.5	35	108	35
020	208/230	94.9	125	315	110	98.5	125	319	110	103.2	125	323	125
	380	55.2	70	203	70	57.2	70	205	70	59.8	80	207	70
	460	46.3	60	165	60	47.9	60	166	60	50.0	60	168	60
	575	35.5	45	126	40	36.9	50	128	45	38.5	50	129	45
025	208/230	130.7	175	402	150	134.3	175	405	150	139.0	175	410	175
	380	71.9	90	206	80	73.9	100	208	90	76.5	100	211	90
	460	60.9	80	181	70	62.5	80	182	70	64.6	80	184	80
	575	48.9	60	137	60	50.3	60	139	60	51.9	70	140	60
030	208/230	147.8	200	457	175	151.4	200	461	175	156.1	200	466	175
	380	79.7	110	266	90	81.7	110	268	90	84.3	110	271	100
	460	67.6	90	216	80	69.2	90	218	80	71.3	90	220	80
	575	57.2	80	173	70	58.6	80	174	70	60.2	80	176	70
035	208/230	—	—	—	—	167.4	200	388	200	172.1	200	392	200
	380	—	—	—	—	101.5	110	249	110	104.1	110	252	110
	460	—	—	—	—	80.2	90	199	90	82.3	90	201	90
	575	—	—	—	—	62.6	70	154	70	64.2	70	155	70
040	208/230	—	—	—	—	201.8	250	435	225	206.5	250	440	225
	380	—	—	—	—	111.3	125	255	125	113.9	125	257	125
	460	—	—	—	—	93.8	110	213	100	95.9	110	216	110
	575	—	—	—	—	72.5	90	168	80	74.1	90	170	80
045	208/230	—	—	—	—	234.4	250	505	250	239.1	250	510	250
	380	—	—	—	—	126.2	150	269	150	128.8	150	271	150
	460	—	—	—	—	105.8	125	225	125	107.9	125	227	125
	575	—	—	—	—	83.7	100	179	90	85.3	100	180	90
050	208/230	—	—	—	—	243.8	250	515	250	248.5	300	519	300
	380	—	—	—	—	131.9	150	266	150	134.5	150	269	150
	460	—	—	—	—	110.6	125	230	125	112.7	125	232	125
	575	—	—	—	—	88.7	100	177	100	90.3	100	179	100
055	208/230	—	—	—	—	256.9	300	575	300	261.6	300	579	300
	380	—	—	—	—	145.7	175	332	175	148.3	175	335	175
	460	—	—	—	—	121.6	125	271	125	123.7	150	273	150
	575	—	—	—	—	97.1	110	217	110	98.7	110	218	110
060	208/230	—	—	—	—	273.1	300	583	300	277.8	300	587	300
	380	—	—	—	—	152.5	175	339	175	155.1	175	342	175
	460	—	—	—	—	127.8	150	277	150	129.9	150	279	150
	575	—	—	—	—	105.0	125	221	125	106.6	125	222	125

NOTE(S):

- Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
- All units/modules have single point primary power connection. (Each unit/module requires its own power supply.) Main power must be supplied from a field-supplied disconnect.
- Evaporator heater is wired into the control circuit so it is always operable as long as the power supply disconnect and heater safety device are on.

LEGEND

ICF — Instantaneous Current Flow
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection



Table 24 — 30RC Single Point Power - Digital Compressor^{a,b,c} (cont)

UNIT 30RC	UNIT VOLTAGE	SINGLE 7.5 HP PUMP, 3600 RPM				SINGLE 10 HP PUMP, 3600 RPM			
		V(3 Ph)	MCA	MOCP	ICF	REC FUSE SIZE	MCA	MOCP	ICF
010	208/230	—	—	—	—	—	—	—	—
	380	—	—	—	—	—	—	—	—
	460	—	—	—	—	—	—	—	—
	575	—	—	—	—	—	—	—	—
015	208/230	—	—	—	—	—	—	—	—
	380	—	—	—	—	—	—	—	—
	460	—	—	—	—	—	—	—	—
	575	—	—	—	—	—	—	—	—
020	208/230	—	—	—	—	—	—	—	—
	380	—	—	—	—	—	—	—	—
	460	—	—	—	—	—	—	—	—
	575	—	—	—	—	—	—	—	—
025	208/230	—	—	—	—	—	—	—	—
	380	—	—	—	—	—	—	—	—
	460	—	—	—	—	—	—	—	—
	575	—	—	—	—	—	—	—	—
030	208/230	—	—	—	—	—	—	—	—
	380	—	—	—	—	—	—	—	—
	460	—	—	—	—	—	—	—	—
	575	—	—	—	—	—	—	—	—
035	208/230	178.0	200	386	200	184.5	200	393	200
	380	107.5	125	247	125	111.1	125	251	125
	460	85.2	100	198	90	88.0	100	201	100
	575	66.6	70	153	70	68.8	80	155	80
040	208/230	212.4	250	434	225	218.9	250	440	250
	380	117.3	125	253	125	120.9	125	257	125
	460	98.8	110	213	110	101.6	110	215	110
	575	76.5	90	167	90	78.7	90	170	90
045	208/230	245.0	250	510	250	251.5	300	516	300
	380	132.2	150	271	150	135.8	150	274	150
	460	110.8	125	227	125	113.6	125	229	125
	575	87.7	100	180	100	89.9	100	183	100
050	208/230	254.4	300	519	300	260.9	300	526	300
	380	137.9	150	269	150	141.5	150	272	150
	460	115.6	125	232	125	118.4	125	235	125
	575	92.7	110	179	100	94.9	110	181	100
055	208/230	267.5	300	573	300	274.0	300	580	300
	380	151.7	175	331	175	155.3	175	334	175
	460	126.6	150	270	150	129.4	150	273	150
	575	101.1	110	216	110	103.3	110	218	110
060	208/230	283.7	300	587	300	290.2	350	594	350
	380	158.5	175	341	175	162.1	175	345	175
	460	132.8	150	279	150	135.6	150	281	150
	575	109.0	125	222	125	111.2	125	224	125

NOTE(S):

- Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
- All units/modules have single point primary power connection. (Each unit/module requires its own power supply.) Main power must be supplied from a field-supplied disconnect.
- Evaporator heater is wired into the control circuit so it is always operable as long as the power supply disconnect and heater safety device are on.

LEGEND

ICF — Instantaneous Current Flow
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection



Table 25 — Fan Electrical Data — Single Point, Standard Low-Sound Aeroacoustic™ Fans
Unit Sizes 010-060^{a,b,c,d}

UNIT 30RC	UNIT VOLTAGE V-Hz (3 Ph)	SINGLE POINT A/B	FIXED SPEED CONDENSER FANS FLA	GREENSPEED CONDENSER FANS FLA	ECM CONDENSER FANS FLA
010 015	208/230-60	1	6.0	6.0	—
	380-60		3.9	3.9	—
	460-60		2.9	2.9	—
	575-60		2.4	2.4	—
020 025 030	208/230-60	2	6.0	6.0	—
	380-60		3.9	3.9	—
	460-60		2.9	2.9	—
	575-60		2.4	2.4	—
035 040 045 050	208/230-60	3	6.0	6.0	—
	380-60		3.9	3.9	—
	460-60		2.9	2.9	—
	575-60		2.4	2.4	—
055 060	208/230-60	4	6.0	6.0	—
	380-60		3.9	3.9	—
	460-60		2.9	2.9	—
	575-60		2.4	2.4	—

NOTE(S):

- Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
- All units/modules have single point primary power connection. (Each unit/module requires its own power supply.) Main power must be supplied from a field-supplied disconnect.
- The unit control circuit power transformer (24 v, single-phase for all voltages) is factory supplied.
- Evaporator heater is wired into the control circuit so it is always operable as long as the power supply disconnect and heater safety device are on.

LEGEND

FLA — Full Load Amps

Table 26 — Pump Electrical Data (60 Hz Only)^{a,b,c,d}

30RC SIZE	PUMP OPTION	PUMP SIZE	PUMP RPM	UNIT VOLTAGE V-Hz (3 Ph)	FLA (each)
010-060	2, 9	1.5 HP	3500	208/230-60	4.3
			3500	380-60	2.4
			3500	460-60	2.1
			3500	575-60	1.6
	3, 4, B, C	3.0 HP	3500	208/230-60	7.9
			3500	380-60	4.4
			3500	460-60	3.7
			3500	575-60	3.0
	5, 6, D, F	5.0 HP	3500	208/230-60	12.6
			3500	380-60	7.0
			3500	460-60	5.8
			3500	575-60	4.6
	7, G	7.5 HP	3500	208/230-60	18.5
			3500	380-60	10.4
			3500	460-60	8.7
			3500	575-60	7.0
	Z, H	10.0 HP	3500	208/230-60	25.0
			3500	380-60	14.0
			3500	460-60	11.5
			3500	575-60	9.2

NOTE(S):

- a. Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
- b. All units/modules have single point primary power connection. (Each unit/module requires its own power supply.) Main power must be supplied from a field-supplied disconnect.
- c. The unit control circuit power transformer (24 v, single-phase for all voltages) is factory supplied.
- d. Evaporator heater is wired into the control circuit so it is always operable as long as the power supply disconnect and heater safety device are on.

FLA — Full Load Amps**Table 27 — Accessory Tank Electrical Data^a**

UNIT VOLTAGE (V-Hz)	ACCESSORY PART NO. 30RA-900--	FLA
208/230-60	050	11.3
	051	11.3
	052	22.6
460-60	050	5.7
	051	5.7
	052	11.3
575-60	050	7.1
	051	7.1
	052	14.1
380-60	050	4.7
	051	4.7
	052	9.3

NOTE(S):

- a. The storage tank obtains its power from the chiller. No separate power source is required.

LEGEND

FLA — Full Load Amps

Table 28 — Compressor Electrical Data

UNIT 30RC	V(3 Ph)	Hz	COMPRESSORS											
			A1			A2			B1			B2		
			Ton	RLA	LRA	Ton	RLA	LRA	Ton	RLA	LRA	Ton	RLA	LRA
010	208/230	60	6	21.7	166.2	4	15.4	155.0	—	—	—	—	—	—
	380	60	6	11.4	93.9	4	9.0	78.9	—	—	—	—	—	—
	460	60	6	11.7	75.0	4	7.7	58.1	—	—	—	—	—	—
	575	60	6	7.2	54.0	4	6.4	47.8	—	—	—	—	—	—
015	208/230	60	9	31.4	265.0	6	21.7	166.2	—	—	—	—	—	—
	380	60	9	20.2	172.8	6	11.4	93.9	—	—	—	—	—	—
	460	60	9	14.7	130.0	6	11.7	75.0	—	—	—	—	—	—
	575	60	9	11.6	93.7	6	7.2	54.0	—	—	—	—	—	—
020	208/230	60	10	35.8	265.0	10	35.8	265.0	—	—	—	—	—	—
	380	60	10	19.7	172.8	10	19.7	172.8	—	—	—	—	—	—
	460	60	10	16.7	140.0	10	16.7	140.0	—	—	—	—	—	—
	575	60	10	12.5	107.6	10	12.5	107.6	—	—	—	—	—	—
025	208/230	60	13	51.7	335.5	13	51.7	335.5	—	—	—	—	—	—
	380	60	13	27.1	169.2	13	27.1	169.2	—	—	—	—	—	—
	460	60	13	22.5	141.0	13	22.5	141.0	—	—	—	—	—	—
	575	60	13	18.0	112.8	13	18.0	112.8	—	—	—	—	—	—
030	208/230	60	15	54.9	364.0	15	54.9	364.0	—	—	—	—	—	—
	380	60	15	31.5	226.0	15	31.5	226.0	—	—	—	—	—	—
	460	60	15	26.0	182.0	15	26.0	182.0	—	—	—	—	—	—
	575	60	15	20.8	145.6	15	20.8	145.6	—	—	—	—	—	—
035	208/230	60	10	35.8	265.0	10	35.8	265.0	9	31.4	265.0	9	31.4	265.0
	380	60	10	19.7	172.8	10	19.7	172.8	9	20.2	172.8	9	20.2	172.8
	460	60	10	16.7	140.0	10	16.7	140.0	9	14.7	130.0	9	14.7	130.0
	575	60	10	12.5	107.6	10	12.5	107.6	9	11.6	93.7	9	11.6	93.7
040	208/230	60	11	43.8	294.0	11	43.8	294.0	10	35.8	265.0	10	35.8	265.0
	380	60	11	26.3	176.4	11	26.3	176.4	10	19.7	172.8	10	19.7	172.8
	460	60	11	21.9	147.0	11	21.9	147.0	10	16.7	140.0	10	16.7	140.0
	575	60	11	17.5	117.6	11	17.5	117.6	10	12.5	107.6	10	12.5	107.6
045	208/230	60	11	43.8	294.0	11	43.8	294.0	13	51.7	335.5	13	51.7	335.5
	380	60	11	26.3	176.4	11	26.3	176.4	13	27.1	169.2	13	27.1	169.2
	460	60	11	21.9	147.0	11	21.9	147.0	13	22.5	141.0	13	22.5	141.0
	575	60	11	17.5	117.6	11	17.5	117.6	13	18.0	112.8	13	18.0	112.8
050	208/230	60	13	51.7	335.5	13	51.7	335.5	13	51.7	335.5	13	51.7	335.5
	380	60	13	27.1	169.2	13	27.1	169.2	13	27.1	169.2	13	27.1	169.2
	460	60	13	22.5	141.0	13	22.5	141.0	13	22.5	141.0	13	22.5	141.0
	575	60	13	18.0	112.8	13	18.0	112.8	13	18.0	112.8	13	18.0	112.8
055	208/230	60	13	51.7	335.5	13	51.7	335.5	15	54.9	364.0	15	54.9	364.0
	380	60	13	27.1	169.2	13	27.1	169.2	15	31.5	226.0	15	31.5	226.0
	460	60	13	22.5	141.0	13	22.5	141.0	15	26.0	182.0	15	26.0	182.0
	575	60	13	18.0	112.8	13	18.0	112.8	15	20.8	145.6	15	20.8	145.6
060	208/230	60	15	54.9	364.0	15	54.9	364.0	15	54.9	364.0	15	54.9	364.0
	380	60	15	31.5	226.0	15	31.5	226.0	15	31.5	226.0	15	31.5	226.0
	460	60	15	26.0	182.0	15	26.0	182.0	15	26.0	182.0	15	26.0	182.0
	575	60	15	20.8	145.6	15	20.8	145.6	15	20.8	145.6	15	20.8	145.6

LEGEND

LRA — Locked Rotor Amps
RLA — Rated Load Amps

Table 29 — Digital Compressor Electrical Data

UNIT 30RC	V(3 Ph)	Hz	COMPRESSORS											
			A1			A2			B1			B2		
			Ton	RLA	LRA	Ton	RLA	LRA	Ton	RLA	LRA	Ton	RLA	LRA
010	208/230	60	6	23.7	164.0	4	15.4	155.0	—	—	—	—	—	—
	380	60	6	11.5	73.0	4	9.0	78.9	—	—	—	—	—	—
	460	60	6	11.7	75.0	4	7.7	58.1	—	—	—	—	—	—
	575	60	6	6.9	54.0	4	6.4	47.8	—	—	—	—	—	—
015	208/230	60	9	31.2	240.0	6	21.7	166.2	—	—	—	—	—	—
	380	60	9	18.5	135.0	6	11.4	93.9	—	—	—	—	—	—
	460	60	9	15.0	130.0	6	11.7	75.0	—	—	—	—	—	—
	575	60	9	11.4	93.7	6	7.2	54.0	—	—	—	—	—	—
020	208/230	60	10	33.8	240.0	10	35.8	265.0	—	—	—	—	—	—
	380	60	10	20.3	152.0	10	19.7	172.8	—	—	—	—	—	—
	460	60	10	17.4	140.0	10	16.7	140.0	—	—	—	—	—	—
	575	60	10	13.3	107.6	10	12.5	107.6	—	—	—	—	—	—
025	208/230	60	13	49.3	300.0	13	51.7	335.5	—	—	—	—	—	—
	380	60	13	27.7	139.0	13	27.1	169.2	—	—	—	—	—	—
	460	60	13	24.3	150.0	13	22.5	141.0	—	—	—	—	—	—
	575	60	13	19.6	109.0	13	18.0	112.8	—	—	—	—	—	—
030	208/230	60	15	61.3	340.0	15	54.9	364.0	—	—	—	—	—	—
	380	60	15	30.1	196.0	15	31.5	226.0	—	—	—	—	—	—
	460	60	15	26.6	173.0	15	26.0	182.0	—	—	—	—	—	—
	575	60	15	24.0	132.0	15	20.8	145.6	—	—	—	—	—	—
035	208/230	60	10	33.8	240.0	10	35.8	265.0	9	31.4	265.0	9	31.4	265.0
	380	60	10	20.3	152.0	10	19.7	172.8	9	20.2	172.8	9	20.2	172.8
	460	60	10	17.4	140.0	10	16.7	140.0	9	14.7	130.0	9	14.7	130.0
	575	60	10	13.3	107.6	10	12.5	107.6	9	11.6	93.7	9	11.6	93.7
040	208/230	60	11	48.4	245.0	11	43.8	294.0	10	35.8	265.0	10	35.8	265.0
	380	60	11	22.9	145.0	11	26.3	176.4	10	19.7	172.8	10	19.7	172.8
	460	60	11	20.6	125.0	11	21.9	147.0	10	16.7	140.0	10	16.7	140.0
	575	60	11	15.5	100.0	11	17.5	117.6	10	12.5	107.6	10	12.5	107.6
045	208/230	60	11	48.4	245.0	11	43.8	294.0	13	51.7	335.5	13	51.7	335.5
	380	60	11	22.9	145.0	11	26.3	176.4	13	27.1	169.2	13	27.1	169.2
	460	60	11	20.6	125.0	11	21.9	147.0	13	22.5	141.0	13	22.5	141.0
	575	60	11	15.5	100.0	11	17.5	117.6	13	18.0	112.8	13	18.0	112.8
050	208/230	60	13	49.3	300.0	13	51.7	335.5	13	51.7	335.5	13	51.7	335.5
	380	60	13	27.7	139.0	13	27.1	169.2	13	27.1	169.2	13	27.1	169.2
	460	60	13	24.3	150.0	13	22.5	141.0	13	22.5	141.0	13	22.5	141.0
	575	60	13	19.6	109.0	13	18.0	112.8	13	18.0	112.8	13	18.0	112.8
055	208/230	60	13	49.3	300.0	13	51.7	335.5	15	54.9	364.0	15	54.9	364.0
	380	60	13	27.7	139.0	13	27.1	169.2	15	31.5	226.0	15	31.5	226.0
	460	60	13	24.3	150.0	13	22.5	141.0	15	26.0	182.0	15	26.0	182.0
	575	60	13	19.6	109.0	13	18.0	112.8	15	20.8	145.6	15	20.8	145.6
060	208/230	60	15	61.3	340.0	15	54.9	364.0	15	54.9	364.0	15	54.9	364.0
	380	60	15	30.1	196.0	15	31.5	226.0	15	31.5	226.0	15	31.5	226.0
	460	60	15	26.6	173.0	15	26.0	182.0	15	26.0	182.0	15	26.0	182.0
	575	60	15	24.0	132.0	15	20.8	145.6	15	20.8	145.6	15	20.8	145.6

LEGEND

LRA — Locked Rotor Amps
RLA — Rated Load Amps

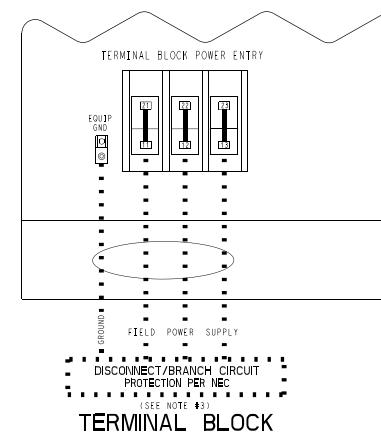
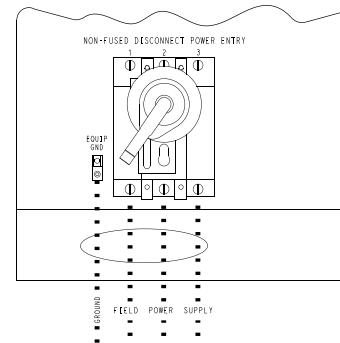
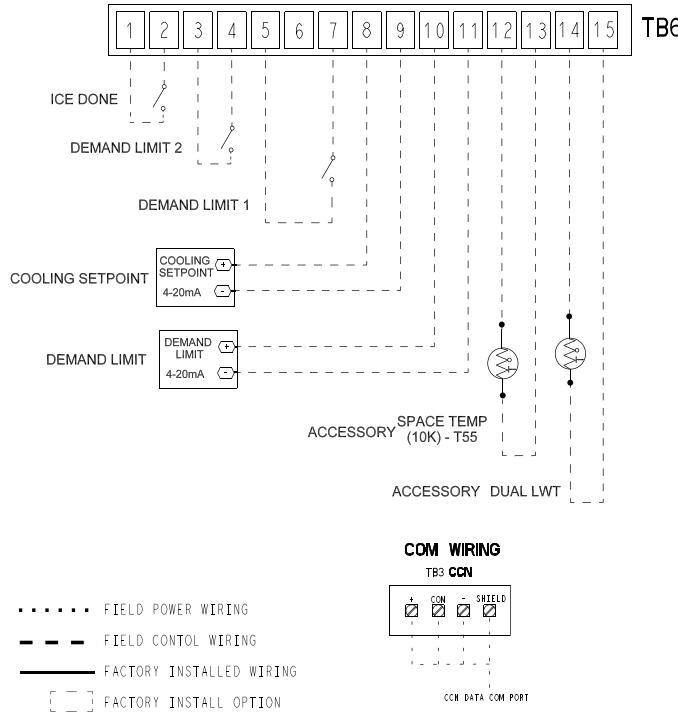
NOTES:

1. FACTORY WIRING IS IN ACCORDANCE WITH UL 60335-40-2 STANDARDS. FIELD MODIFICATIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
2. ALL UNITS OR MODULES HAVE SINGLE POINT PRIMARY POWER CONNECTION. MAIN POWER MUST BE SUPPLIED FROM A FIELD OR FACTORY SUPPLIED DISCONNECT.
3. WIRING FOR MAIN FIELD SUPPLY MUST BE RATED 75°C. USE COPPER CONDUCTORS ONLY.

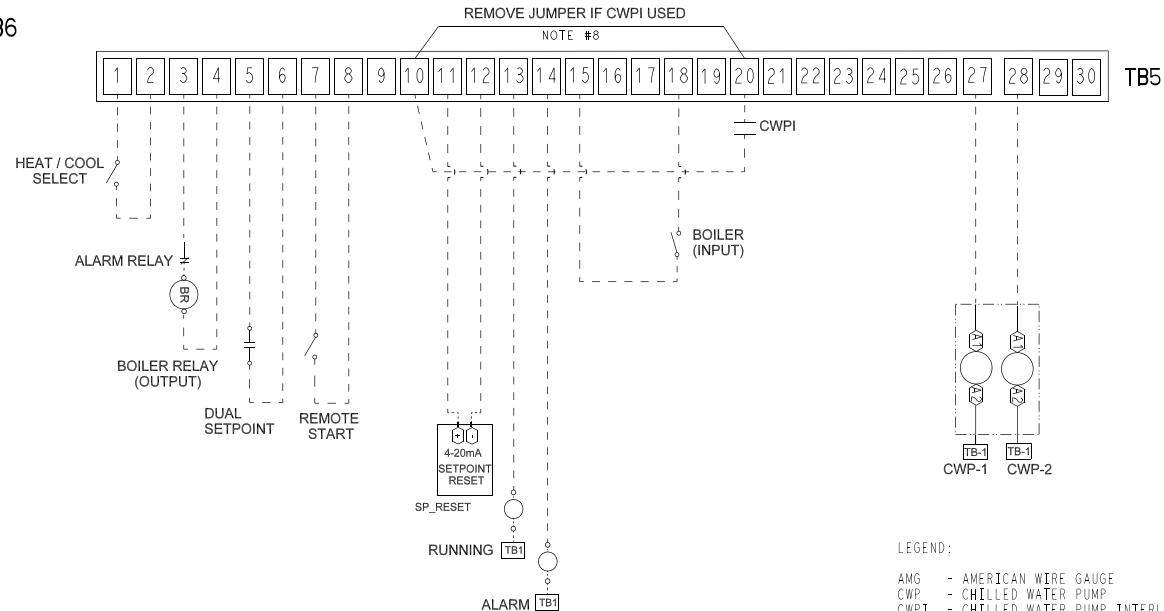
CONNECTION TYPE	MCA RANGE	WIRE SIZE RANGE	MAXIMUM NUMBER OF WIRES PER PHASE	HIGH SCRR FUSE TYPE
TERMINAL BLOCK	MCA UP TO 175	14 AWG TO 2/0 AWG	1	J, T, RK1, RK5, G, CC
	MCA 175.1 TO 420	2 AWG TO 600kcmil	1	J, T, RK1, RK5, G, CC
NON-FUSED DISCONNECT	MCA UP TO 125	14 AWG - 3/0 AWG	1	-
	MCA 125.1 TO 225	4 AWG TO 4/0	1	-
NON-FUSED DISCONNECT	2/0 AWG TO 500kcmil	1	-	-
	MCA 225.1 TO 400	2/0 AWG TO 250kcmil	2	-

4. REFER TO CERTIFIED DIMENSIONAL DRAWINGS FOR EXACT LOCATIONS OF THE MAIN POWER AND CONTROL POWER ENTRANCE LOCATION.
5. TB5-28 AND TB1 ARE FOR CONTROL OF CHILLED WATER PUMP1 (CWP1) STARTER. TB5-27 AND TB1 ARE FOR CONTROL OF CHILLED WATER PUMP2 (CWP2) STARTER. THE MAXIMUM LOAD ALLOWED FOR THE CHILLED WATER PUMP RELAY IS 5 VA SEALED, 10 VA INRUSH AT 24 V. FIELD POWER SUPPLY IS NOT REQUIRED.
6. TERMINALS TB5-13 AND TB5-14 ARE FOR RUNNING AND ALARM RELAYS. THE MAXIMUM LOAD ALLOWED FOR THE ALARM RELAY IS 5 VA SEALED, 10 VA INRUSH AT 24V. FIELD POWER SUPPLY IS NOT REQUIRED.
7. THE CONNECTION FOR DEMAND LIMIT AND ICE DONE OPTIONS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP TO 50 MA. INSTALLATION OF OPTIONAL ENERGY MANAGEMENT BOARD REQUIRED.
8. REMOVE FACTORY INSTALLED JUMPER BETWEEN TERMINALS TB5-10 AND 20 WHEN FIELD CWPI IS INSTALLED.
9. TB5-7 AND 8 OF TB5 ARE FOR FIELD EXTERNAL CONNECTIONS FOR REMOTE ON-OFF. THE CONTACTS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP 50MA.

EMM OPTION



NON-FUSED DISCONNECT



TYPICAL MAIN POWER & CONTROL CONNECTIONS

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	30RC 010-060T ELECTRICAL	30RC60001070	REV
U.S. ECCN:EAR99	1 OF 1	10/19/23	-	30RC 010-060T ELECTRICAL	30RC60001070	-

Fig. 32 — Typical Main Power and Control Connections

CONTROL POWER

IMPORTANT: To ensure power to the heaters, make sure main power to the unit and the compressor circuit breakers is always on (except for servicing or prolonged shutdown). Since water cannot be drained completely, add an appropriate amount of inhibited glycol as noted for winter shutdown.

⚠ CAUTION

Proper rotation of condenser fan(s), pumps and compressors **MUST** be verified. Consult the Controls, Start-Up, Operation, Service, and Troubleshooting manual provided with this chiller for correct procedure. If pump(s) have been removed for trimming, verify that wiring is reconnected in the original manner. Failure to follow these procedures may result in damage to equipment.

Control power is obtained from the main power supply and does **NOT** require a separate source. A toggle switch (marked Emergency On-Off on the unit label diagram and by the switch) allows the control circuit to be manually disconnected when necessary.

IMPORTANT: For 208-v systems, the primary connection tap for all transformers must be changed. The factory default setting is for 230 v. Failure to connect to the proper tap may result in unreliable operation.

Step 6 — Install Accessories

ELECTRICAL

A number of electrical accessories are available to provide the following optional features (for details, refer to the Controls, Start-Up, Operation, Service, and Troubleshooting book):

Energy Management Module

(Used for any of the following types of temperature reset, demand limit and ice features):

- 4 to 20 mA leaving fluid temperature reset (requires field-supplied 4 to 20 mA generator)
- 4 to 20 mA cooling set point reset (requires field-supplied 4 to 20 mA generator)
- Discrete inputs for 2-step demand limit (requires field-supplied dry contacts)
- 4 to 20 mA demand limit (requires field-supplied 4 to 20 mA generator)
- Discrete input for Ice Done switch (requires field-supplied dry contacts)

High Efficiency Condenser Fan

If outdoor ambient operating temperatures below 45°F (7°C) on size 020-030 units or 32°F (0°C) on size 035-60 units are expected, refer to separate installation instructions for high efficiency condenser fan.

Hot Gas Bypass Accessory

If hot gas bypass accessory is required, refer to unit Price Pages or contact your local Carrier representative for more details. For installation details, refer to separate installation instructions supplied with the accessory package.

Miscellaneous Accessories

For applications requiring special accessories, the following packages are available: external vibration isolation, temperature reset, hail guard/security grilles, storage tank, wind baffles, and remote evaporator. For installation details, refer to separate installation instructions supplied with these accessory packages.

Step 7 — Check Refrigerant Circuit

DETECTION OF FLAMMABLE REFRIGERANTS

When working with the refrigerant side of the system follow these precautions. Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

REMOVAL AND EVACUATION

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

- Safely remove refrigerant following local and national regulations.
- Evacuate.
- Continuously flush or purge with inert gas when using flame to open circuit.
- Open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. The system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. Refrigerant purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

CHARGING PROCEDURES

In addition to conventional charging procedures, the following requirements shall be followed:

- Ensure that contamination of different refrigerants does not occur when using charging equipment.
- Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
- Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

RECOVERY

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available.

All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, FLAMMABLE REFRIGERANTS. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

REFRIGERANT CHARGE

Immediately after the condenser coil in each circuit is a 1/4 in. Schrader connection for charging liquid refrigerant.

Utilization of Novation® heat exchanger technology coils enables the 30RC chiller to have a very low refrigerant charge. Therefore,

if field charging is required, accurately charging to the correct quantity is very important. It is necessary to ensure that the system is completely evacuated before charging and that the refrigerant charge is accurately weighed to within 1% of the nameplate quantity or the unit may not operate correctly.

CAUTION

When charging, circulate water through the evaporator at all times to prevent freezing. Freezing damage is considered abuse and may impair or otherwise negatively affect the Carrier warranty.

CAUTION

DO NOT OVERCHARGE system. Overcharging results in higher discharge pressure, increased power consumption, and possible compressor damage.

The suction lines are provided with a 1/4 in. Schrader fitting for connecting to low-side system pressure. The location of the suction access port is shown in Fig. 33.

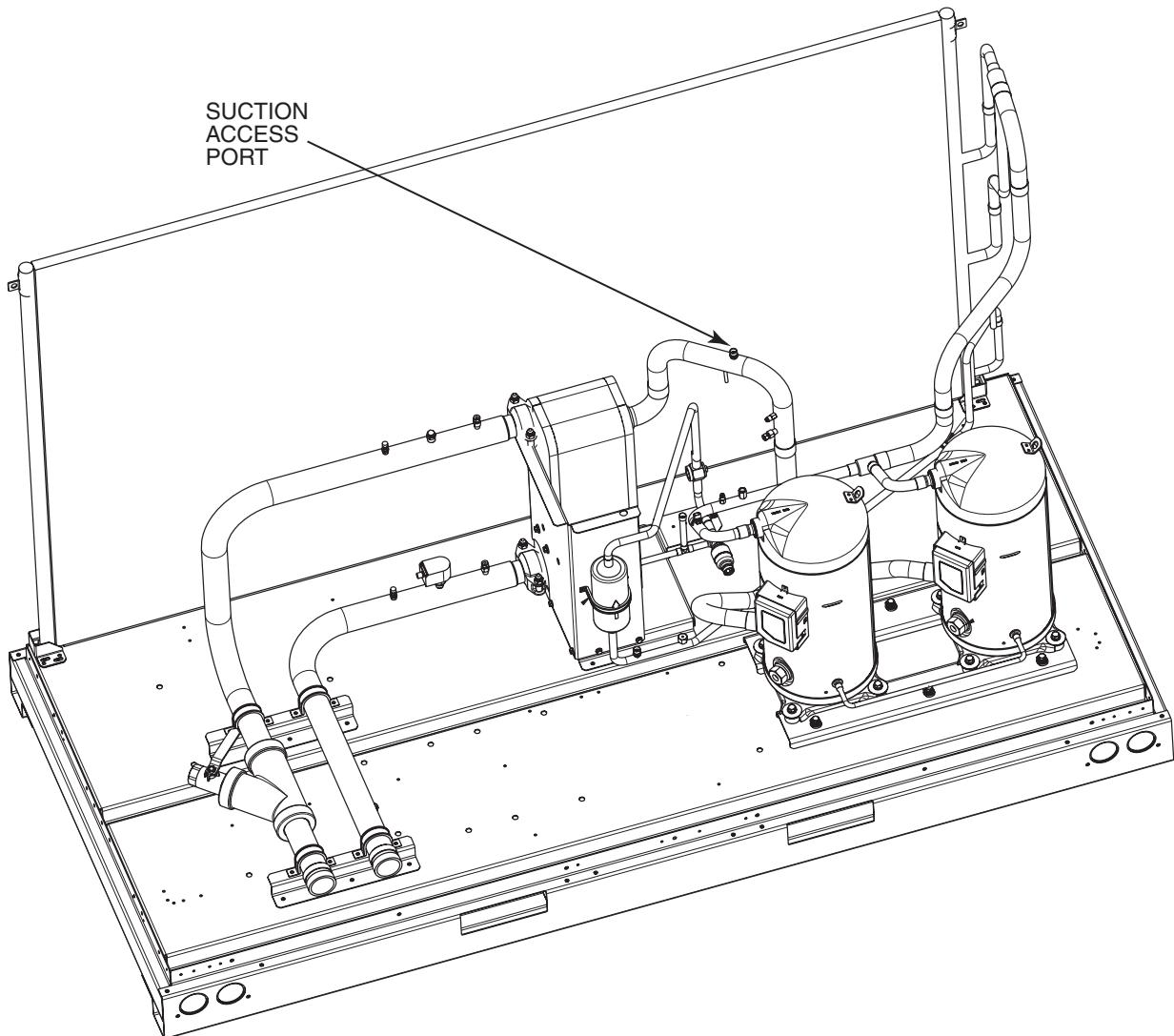


Fig. 33 — Suction Access Port (Sizes 015-030 Shown)

CARRIER COMFORT NETWORK® (CCN) COMMUNICATION BUS WIRING

The communication bus wiring is a shielded, 3-conductor cable with drain wire and is field supplied and installed in the field.

The system elements are connected to the communication bus in a daisy chain arrangement. The positive pin of each system element communication connector must be wired to the positive pins of the system elements on either side of it. This is also required for the negative and signal ground pins of each system element. Wiring connections for CCN should be made at TB 3 (terminal block). Consult the CCN Contractor's Manual for further information. See Fig. 34.

NOTE: Conductors and drain wire must be 20 AWG 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 (-20°C) to 140°F (60°C) is required. Refer to Table 30 for a list of manufacturers that produce CCN bus wiring that meets these requirements.

Table 30 — CCN Communication Bus Wiring

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

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

1. Third-party trademarks and logos are the property of their respective owners.

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

To connect the unit to the network:

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

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

BACNET IP, MSTP OR ETHERNET COMMUNICATION

The 30RC units come standard with Ethernet communications and with BACnet as an option. The cabling for this is standard CAT 5 (minimum) with RJ45 connector.

NON-CCN COMMUNICATION WIRING

The 30RC units offer several non-CCN translators. Refer to the separate installation instructions for additional wiring steps.

MS/TP WIRING RECOMMENDATIONS

Recommendations are shown in Tables 31 and 32. The wire jacket and UL (Underwriters Laboratories) temperature rating specifications list 2 acceptable alternatives. The Halar®¹ specification has a higher temperature rating and a tougher outer jacket than the SmokeGard™¹ specification, and it is appropriate for use in applications where the user is concerned about abrasion. The Halar jacket is also less likely to crack in extremely low temperatures.

NOTE: Use the specified type of wire and cable for maximum signal integrity.

Table 31 — MS/TP Wiring Recommendations

SPECIFICATION	RECOMMENDATION
Cable	Single twisted pair, low capacitance, CL2P, 22 AWG (7x30), TC foam FEP, plenum rated cable
Conductor	22 or 24 AWG stranded copper (tin plated)
Insulation	Foamed FEP 0.015 in. (0.381 mm) wall 0.060 in. (1.524 mm) OD
Color Code	Black/White
Twist Lay	2 in. (50.8 mm) lay on pair 6 twists/foot (20 twists/meter) nominal
Shielding	Aluminum/Mylar shield with 24 AWG TC drain wire
Jacket	SmokeGard Jacket (SmokeGard PVC) 0.021 in. (0.5334 mm) wall 0.175 in. (4.445 mm) OD Halar Jacket (E-CTFE) 0.010 in. (0.254 mm) wall 0.144 in. (3.6576 mm) OD
DC Resistance	15.2 Ohms/1000 ft (50 Ohms/km) nominal
Capacitance	12.5 pF/ft (41 pF/meter) nominal conductor to conductor
Characteristic Impedance	100 Ohms nominal
Weight	12 lb/1000 ft (17.9 kg/km)
UL Temperature Rating	SmokeGard 167°F (75°C), Halar -40 to 302°F (-40 to 150°C)
Voltage	300 vac, power limited
Listing	UL: NEC CL2P or better

See legend below Table 32.

Table 32 — Open System Wiring Specifications and Recommended Vendors

WIRING SPECIFICATIONS		RECOMMENDED VENDORS AND PART NUMBERS			
WIRE TYPE	DESCRIPTION	CONNECT AIR INTERNATIONAL	BELDEN	RMCORP	CONTRACTORS WIRE AND CABLE
MS/TP Network (RS-485)	22 AWG, single twisted shielded pair, low capacitance, CL2P, TC foam FEP, plenum rated. See MS/TP Installation Guide for specifications.	W221P-22227	—	25160PV	CLP0520LC
	24 AWG, single twisted shielded pair, low capacitance, CL2P, TC foam FEP, plenum rated. See MS/TP Installation Guide for specifications.	W241P-2000F	82841	25120-OR	—
Rnet	4 conductor, unshielded, CMP, 18 AWG, plenum rated.	W184C-2099BLB	6302UE	21450	CLP0442

LEGEND

AWG — American Wire Gauge

CL2P — Class 2 Plenum Cable

CMP — Communications Plenum Rated

DC — Direct Current

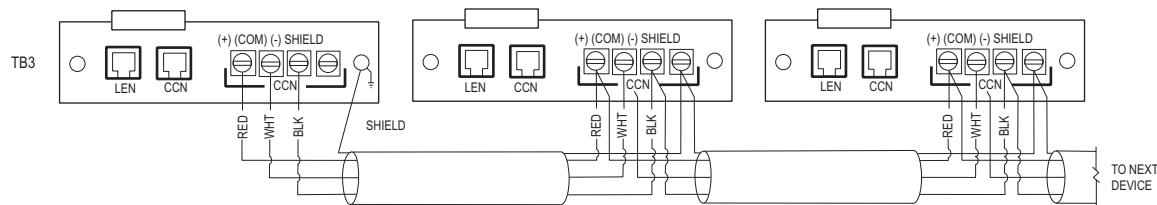
FEP — Fluorinated Ethylene Polymer

NEC — National Electrical Code

O.D. — Outside Diameter

TC — Tinned Copper

UL — Underwriters Laboratories



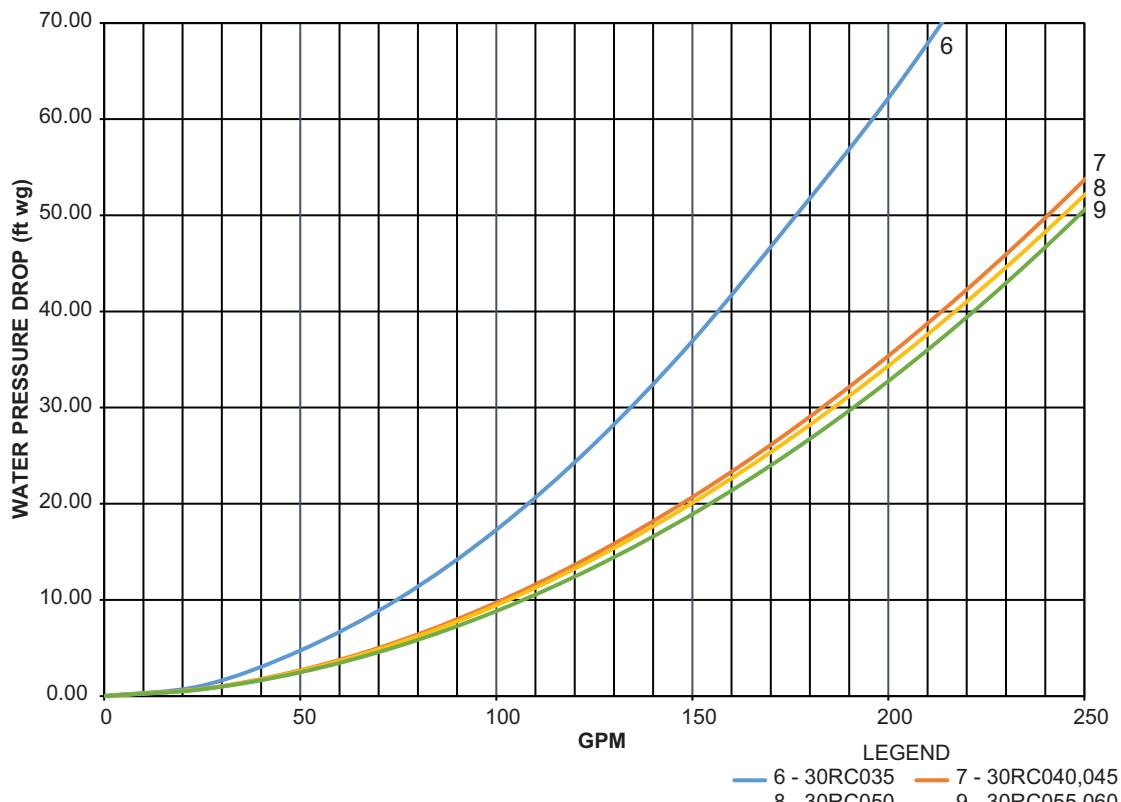
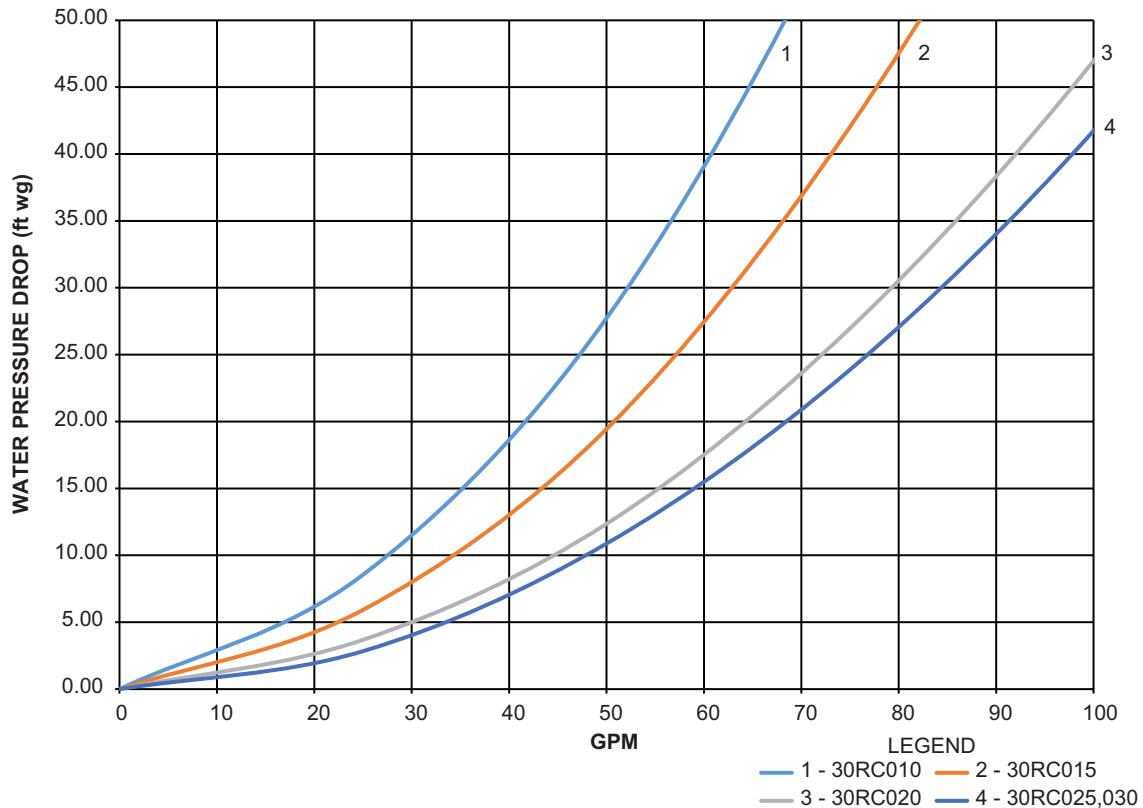
LEGEND

CCN — Carrier Comfort Network

LEN — Local Equipment Network

Fig. 34 — TB-3 — CCN Wiring

APPENDIX A — Unit Pressure Drop Curves
Unit Pressure Drop Curves, 30RC010-060 (English)



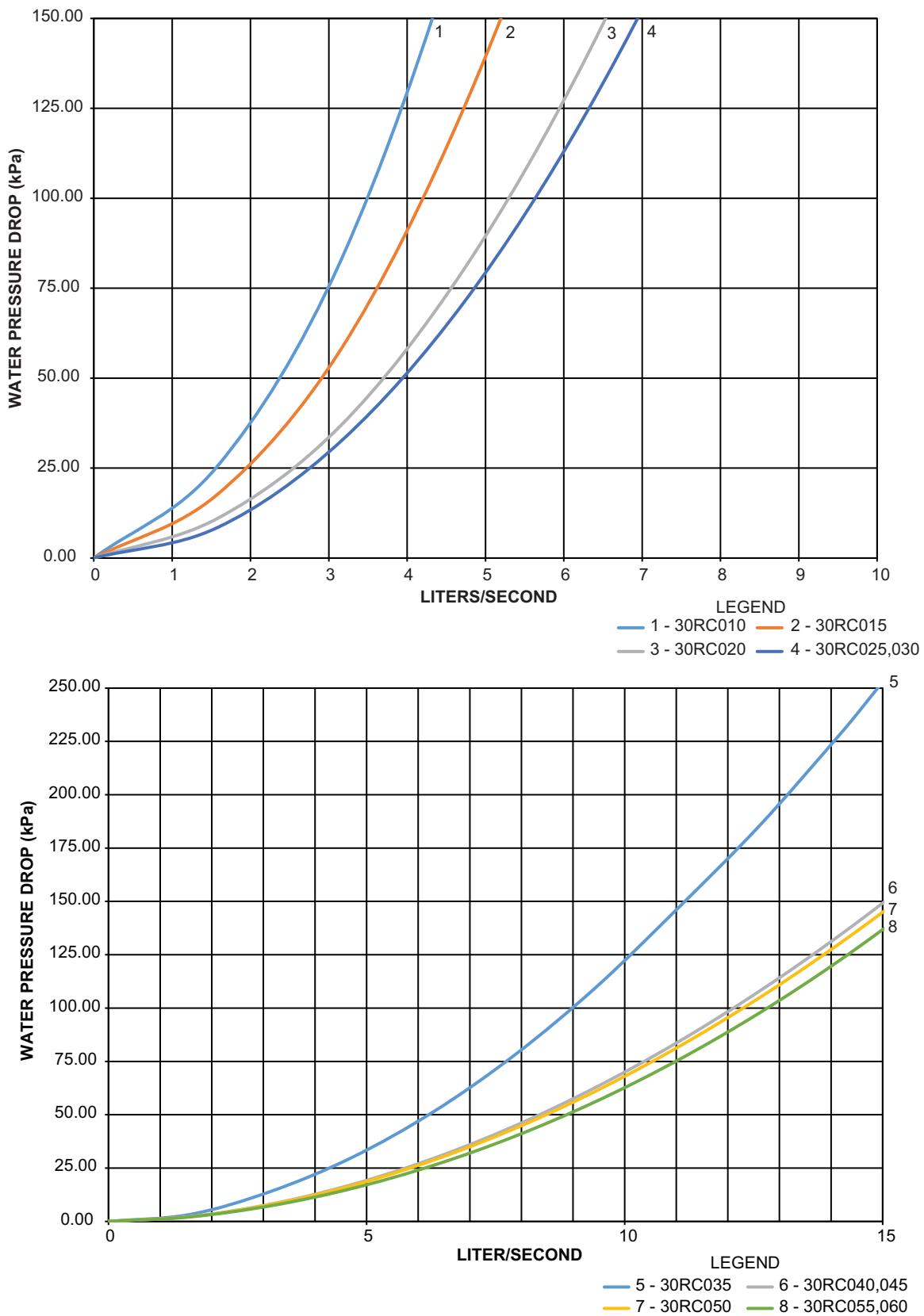
NOTES:

1. Use the following formula to convert feet of water to psig: ft of water (.4335) = psig
2. Use the following formula to convert psig to feet of water: psig (2.306) = ft of water
3. Pressure drop curves are suitable for water only.
4. Includes strainer and unit piping.

Fig. A — Units Without Hydronic Package

APPENDIX A — UNIT PRESSURE DROP CURVES (cont)

Unit Pressure Drop Curves, 30RC010-060 (SI)



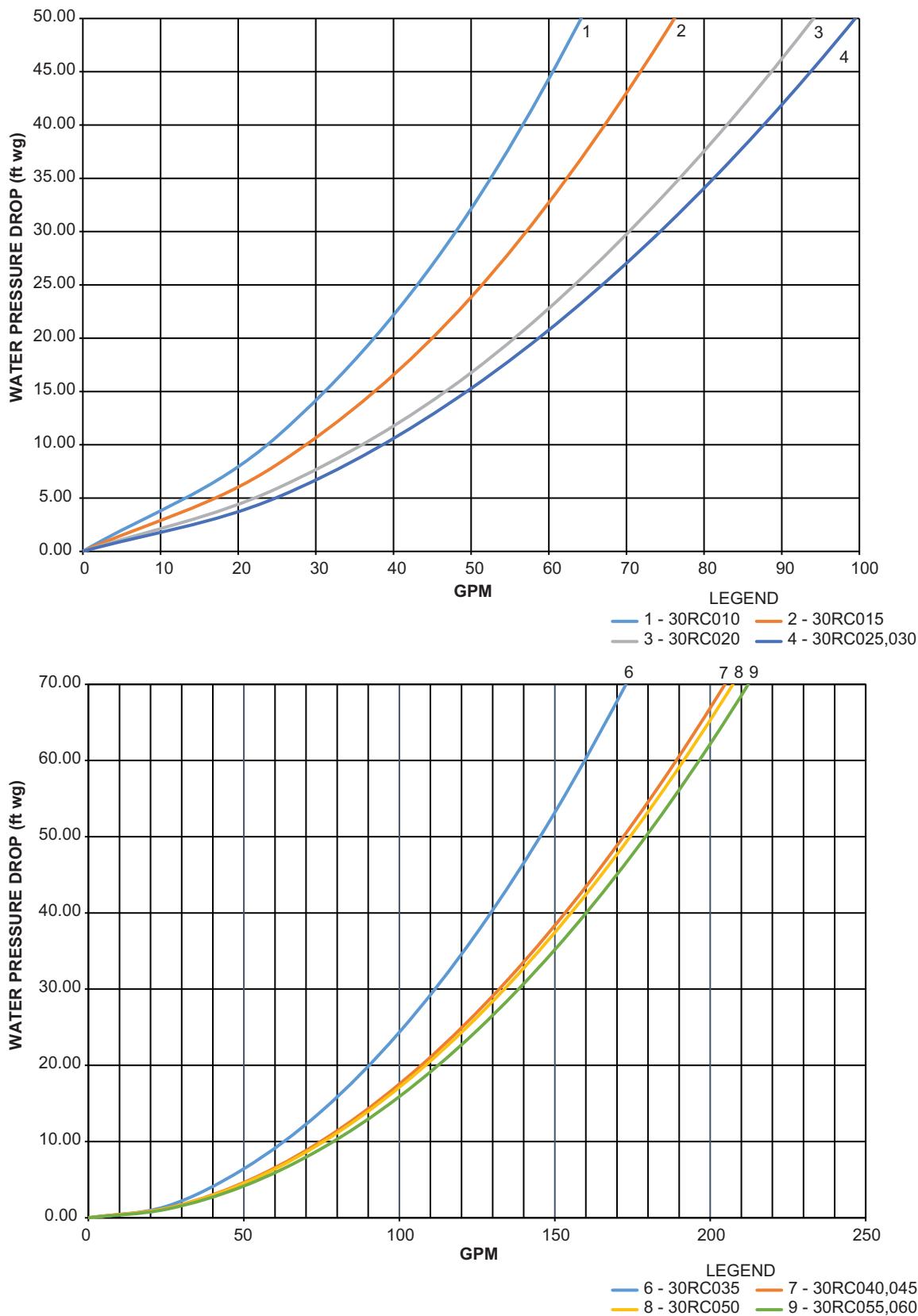
NOTES:

1. Pressure drop curves are suitable for water only.
2. Includes strainer and unit piping.

Fig. A — Units Without Hydronic Package (cont)

APPENDIX A — UNIT PRESSURE DROP CURVES (cont)

Unit Pressure Drop Curves, 30RC010-060 (English)



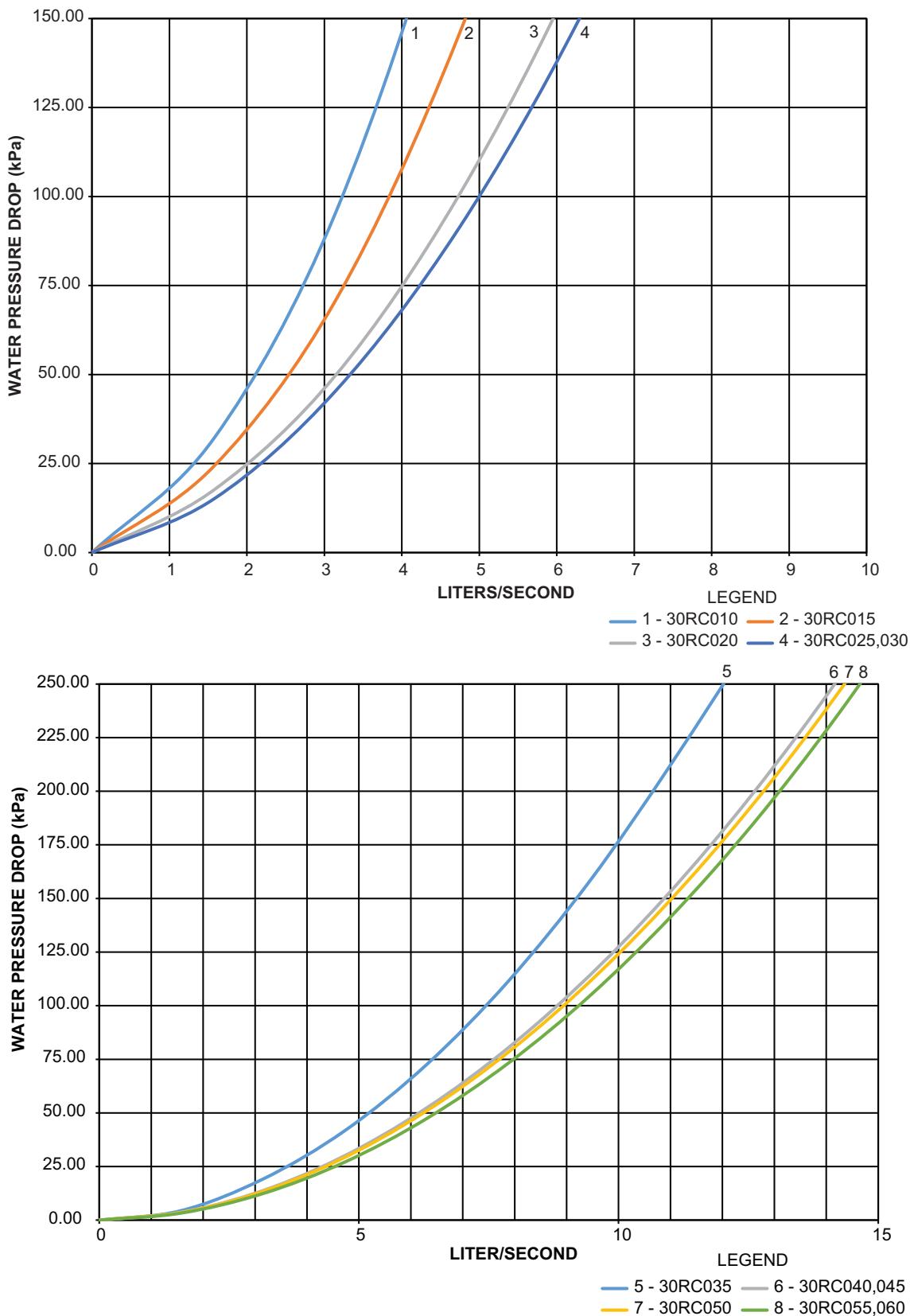
NOTES:

1. Use the following formula to convert feet of water to psig: ft of water (.4335) = psig
2. Use the following formula to convert psig to feet of water: psig (2.306) = ft of water
3. Pressure drop curves are suitable for water only.
4. Includes strainer and unit piping.

Fig. B — Units With Single Pump Hydronic Package

APPENDIX A — UNIT PRESSURE DROP CURVES (cont)

Unit Pressure Drop Curves, 30RC010-060 (SI)



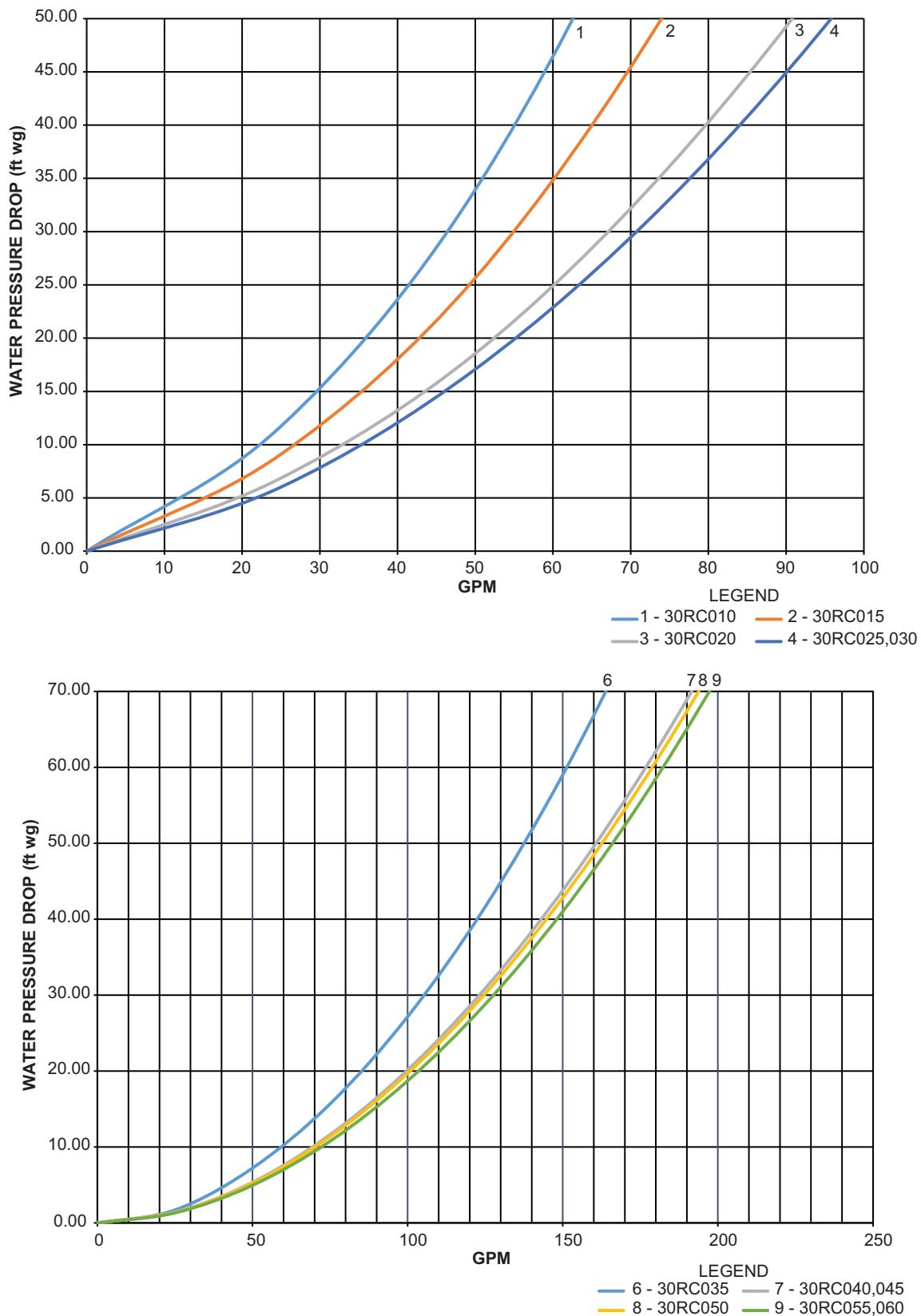
NOTES:

1. Pressure drop curves are suitable for water only.
2. Includes strainer and unit piping.

Fig. B — Units With Single Pump Hydronic Package (cont)

APPENDIX A — UNIT PRESSURE DROP CURVES (cont)

Unit Pressure Drop Curves, 30RC010-060 (English)



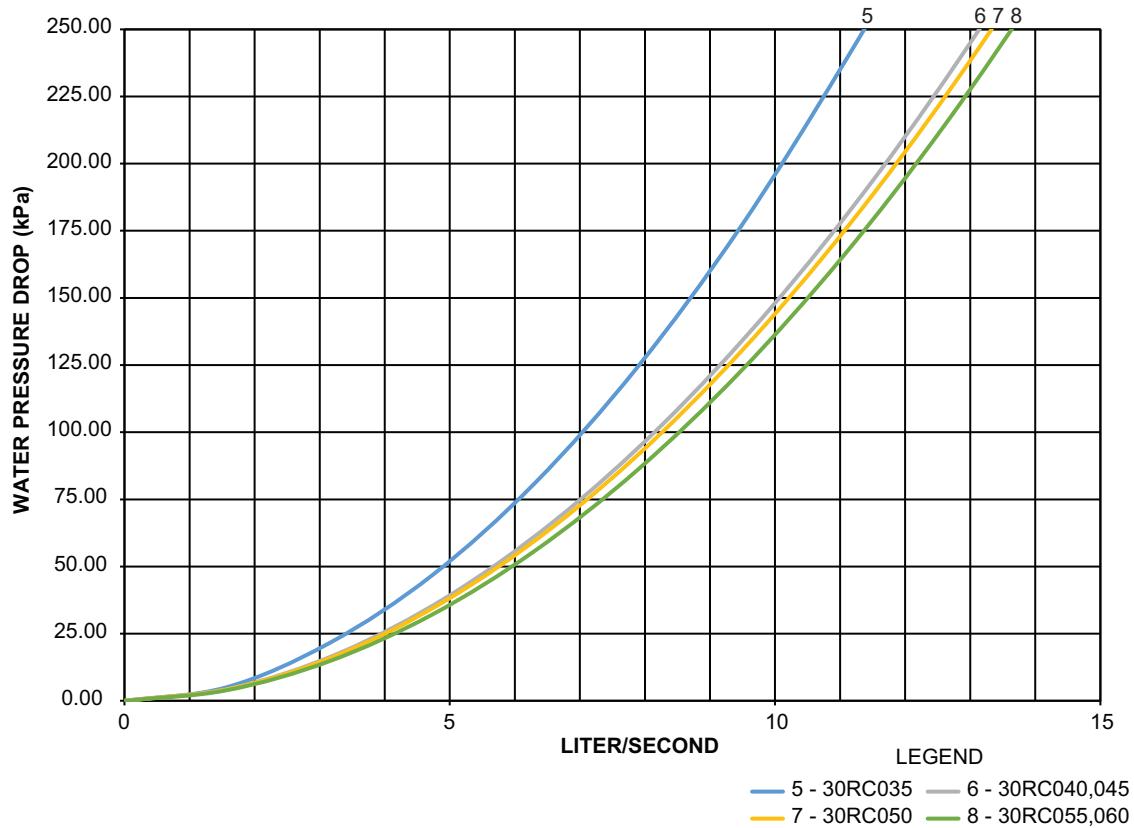
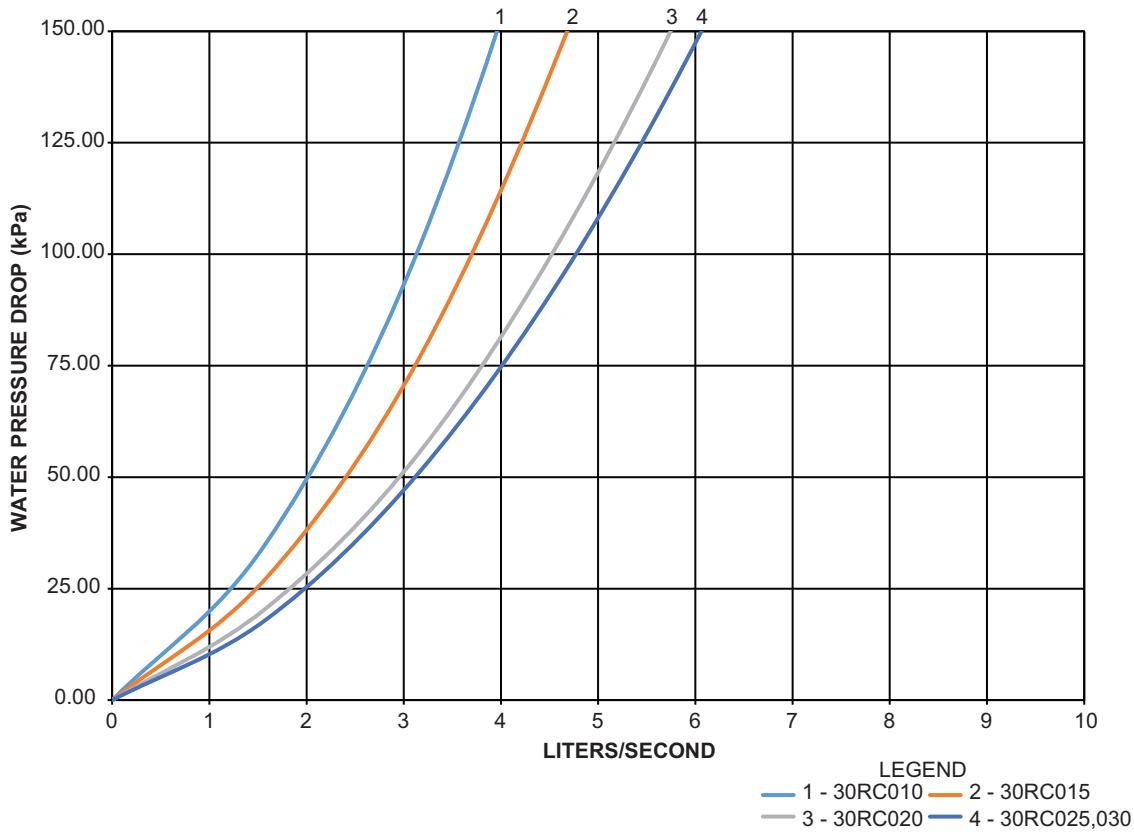
NOTES:

1. Use the following formula to convert feet of water to psig: ft of water (.4335) = psig.
2. Use the following formula to convert psig to feet of water: psig (2.306) = ft of water
3. Pressure drop curves are suitable for water only.
4. Includes strainer and unit piping.

Fig. C — Units With Dual Pump Hydronic Package

APPENDIX A — UNIT PRESSURE DROP CURVES (cont)

Unit Pressure Drop Curves, 30RC010-060 (SI)



NOTES:

1. Pressure drop curves are suitable for water only.
2. Includes strainer and unit piping.

Fig. C — Units With Dual Pump Hydronic Package (cont)

APPENDIX A — UNIT PRESSURE DROP CURVES (cont)

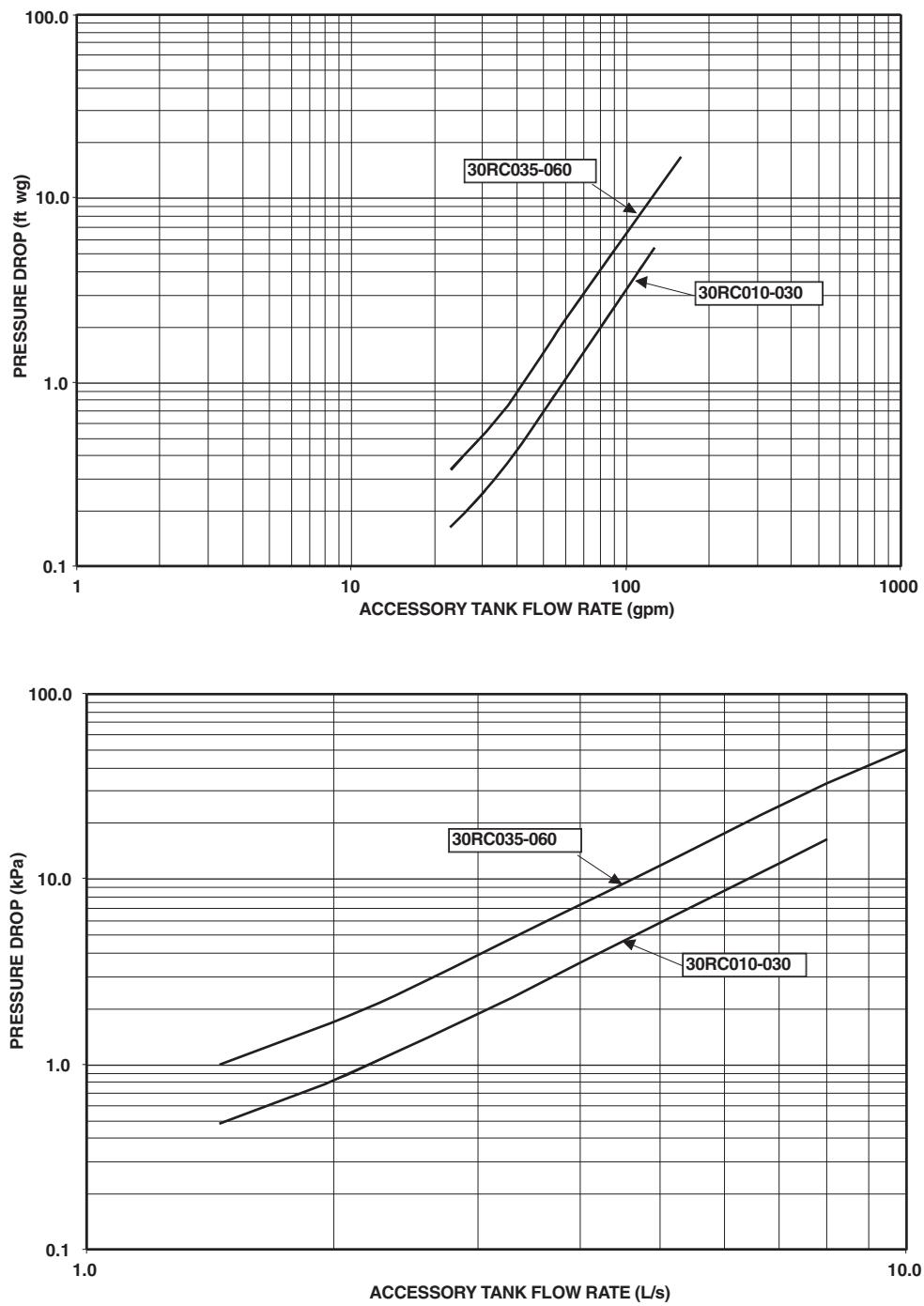


Fig. D — Pressure Drop Curves, Accessory Storage Tanks

