30RC067-252 R-32 Units
Remote Evaporator
(Brazed Plate Heat Exchanger Only)
Mounting Accessory

Installation Instructions

Part No. 30RC70000101 (R-32)

SAFETY CONSIDERATIONS

Installation of this accessory can be hazardous due to system pressures, electrical components, and equipment location (such as a roof or elevated structure). Only trained, qualified installers and service technicians 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:

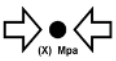
- Explosive potential of A2L refrigerants
- Potential ignition sources
- Safety measures for unventilated and ventilated rooms or enclosures
- Refrigerant detectors
- Concept of sealed components and sealed enclosures according to IEC 60079-15:2010
- Correct work procedures for the following:
  - Commissioning
  - Maintenance
  - Repair
  - Decommissioning
  - Disposal

When installing this accessory, observe precautions in the literature, labels attached to the equipment, and any other safety precautions that apply:

- Follow all safety codes
- Wear safety glasses and work gloves
- Use care in handling and installing this accessory

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.

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:

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

⚠ WARNING

This product can expose you to chemicals including lead and lead components, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this warning could cause personal injury, death and/or equipment damage.

This system uses an A2L refrigerant (R-32), which operates at 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 R-32 may result in equipment damage or personal injury. Refer to section "Safety Considerations for R-32 (A2L) Refrigerants" for guidelines on proper A2L refrigerant handling and equipment used for A2L refrigerants on page 14. If unsure about equipment, consult the equipment manufacturer.

⚠ CAUTION

To prevent potential damage to heat exchanger, always run fluid through heat exchanger when adding or removing refrigerant charge. Use appropriate brine solutions in cooler fluid loop to prevent the freezing of heat exchanger, optional hydronic section and/or interconnecting piping when the equipment is exposed to temperatures below 32°F (0°C). Proof of flow switch is factory installed on all models. Permanent strainer is factory installed on all BPHE models. Start-up strainer is factory installed on DX models with the optional integrated hydronic package. Do NOT remove power from this chiller during winter shutdown periods without taking precaution to remove all water from heat exchanger and optional hydronic system. Failure to properly protect the system from freezing may constitute abuse and may void warranty.

⚠ WARNING

DO NOT VENT refrigerant relief valves within a building. Outlet from relief valves must be vented outdoors in accordance with the latest edition of ANSI/ASHRAE (American National Standards Institute/American Society of Heating, Refrigerating and Air-Conditioning Engineers) 15 (Safety Code for Mechanical Refrigeration). The accumulation of refrigerant in an enclosed space can display oxygen which can cause asphyxiation. This unit uses R-32 refrigerant with a A2L flammability classification. Accumulation may cause an explosion if ignited. Provide adequate ventilation in enclosed or low overhead areas. Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness or death. Misuse can be fatal. Vapor is heavier than air and reduces the amount of oxygen available for breathing. Product causes eye and skin irritation. Decomposition products are hazardous.

⚠ WARNING

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

GENERAL

The remote evaporator accessory allows for indoor relocation of the evaporator as another means of freeze protection. When the evaporator is located in the heated space, an antifreeze solution is not needed and the performance degradation associated with the antifreeze solution can be avoided. With the evaporator in the interior space, ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers) 15 considerations are required.

Calculate the total refrigerant charge base on the unit charge and additional refrigerant line length charge. If the quantity of refrigerant needed exceeds the limits defined by ASHRAE 15 Sections 7.2 and 7.3, all components containing refrigerant shall be located in a machinery room meeting the requirements of ASHRAE 15. If a machinery room is not required, the following requirements must be met in the installation Room. The mechanical ventilation of the room is required per ASHRAE 15 7.6.4.

Leak detector shall comply with UL 60335-2-40 Annex LL. it shall be tripped once the leakage is at or above 25% of the LFL (lower flammability limit, ASHRAE 34. R-32 LFL is 0.00477 lb/cu ft (0.0765kg/cu m). The leak signal shall be set up to shut down the chiller.

A normally open relay should be wired between TB5-1 and TB5-2 or in series with the pump interlock if installed. The relay should be closed when the refrigerant leak detector is in normal operation - no leak detected. The relay should open when a leak is detected, see Fig. 1 for wiring details. When TB5-1 and TB5-2 is not connected, the chiller will alarm "CUSTOMER INTERLOCK FAILURE" and shut down the chiller.

Air separation vent is required on the Leaving water piping. This vent must be piped to the outside.

R-32 refrigerant labels should be placed on the evaporator and any refrigerant access point.

Maximum separation of the 30RC base unit and evaporator is limited to:

- Plate fin coils: 75 linear ft (22 m) of piping.
- Microchannel coils: 50 linear ft (15 m) of piping.

Maximum evaporator elevation above the condensing section is limited to 15 ft (4.5 m). Relocating the evaporator introduces minimal line losses if correct piping practices are followed. See Table 1 for accessory package contents.

In addition to the parts supplied with the accessory package, the following material must be field-supplied:

- Refrigerant grade liquid, hot gas bypass, and suction line piping (length determined by installation)
- Water piping and fittings
- Suction and water line tubing insulation (length determined by installation). Minimum R-value of 25 (m deg. K/W) recommended.
- Electrical conduit (length determined by installation)
- Assorted refrigerant grade fittings according to site requirements (elbows, tees, refrigerant pipe couplings, etc.)

⚠ CAUTION

This system uses an A2L refrigerant (R-32). No other refrigerant may be used in this system. Suction tubing design pressure is 445 psig (3068 kPa) and liquid tubing design pressure is 656 psig (4522 kPa). Failure to use gauge set, hoses, and recovery systems designed to handle R-32 refrigerant may result in personal injury and equipment damage. If unsure about equipment, consult the equipment manufacturer.

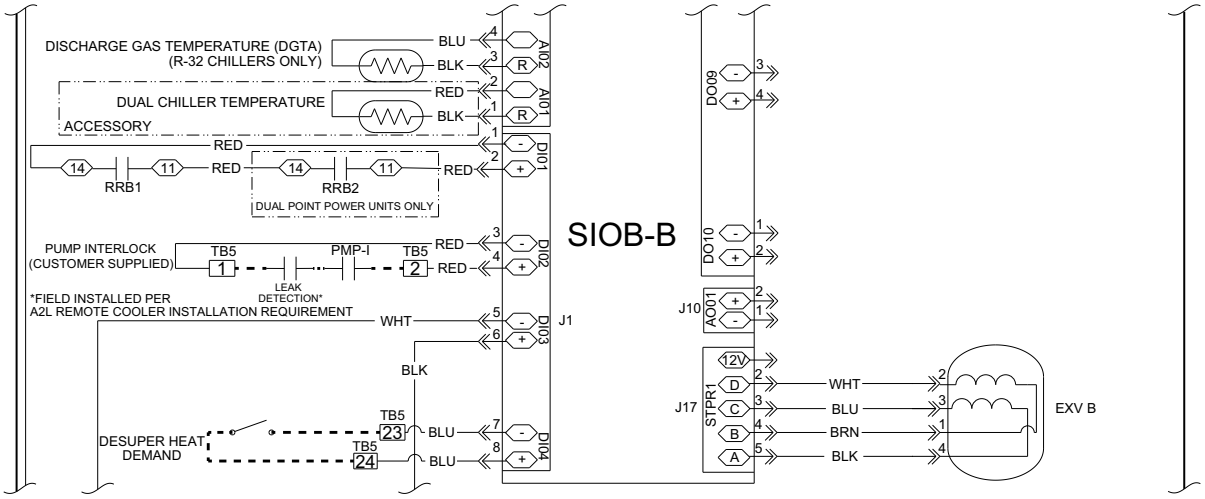


Fig. 1 — Recommended Wiring For Chiller Shut Down During Leak Detection, SIOB-B J1

Table 1 — 30RC70000101 Accessory Package Contents for 30RC067-252 R-32 Units

PART NUMBER	QUANTITY	DESCRIPTION
HX30FZ001	1	Junction Box, Waterproof
HX38ZZ001	1	Box Cover, Waterproof
RM02EJ200	100 ft	22 ga 5 Conductor Thermistor Cable
32GB404694	3	Cable Assembly (EXV and Flow Switch)
HW60EA001	2	Strain Relief Connector – 1/2 in.
EB51RW121	2	1/4 in. NPTF Pressure Relief Valve (630 psig)
2003776917	1	Label, Owners Manual
2003776918	1	Label, A2L Flame Symbol
2003776919	2	Label, Service Port
2003776920	1	Label, Fire Risk
2003776922	1	Label, Fire Risk
2003776923	1	Label, Fire Risk
2002851493	1	Label, R-32 Refrigerant
2009348539	1	Label, Charging

INSTALLATION

Perform the following to install the remote evaporator mounting accessory (if the evaporator is shipped loose from the factory as part of the special order, skip Steps 3-11):

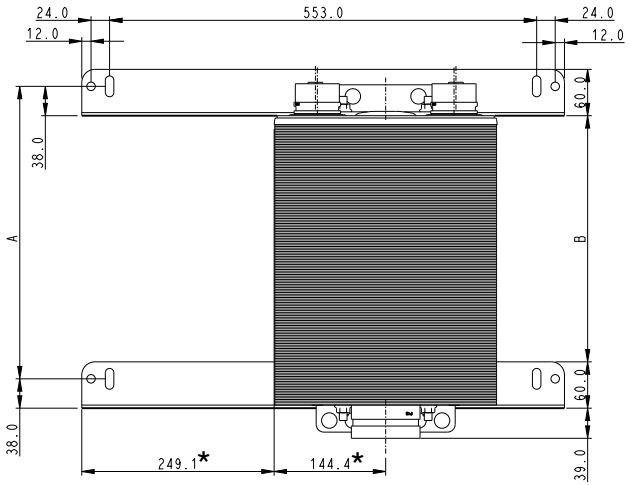
1. Inspect package contents for any missing or damaged parts. File a claim with the shipping agency if parts are damaged. Notify your Carrier representative if any item is missing.
2. Determine the new location for the evaporator. Ensure that the new location supports the evaporator weight. See Fig. 2 and 3 for evaporator dimensions and Table 2 for evaporator weight.
3. Turn off the electrical power to the unit using the optional disconnect or the field-installed disconnect and lock off using proper lockout and tag-out procedures.
4. Recover refrigerant charge from all circuits using standard refrigeration practices before cutting any refrigerant lines. Refer to unit nameplate or installation instructions for refrigerant quantities.
5. Disconnect evaporator heater conduit and wiring, if equipped.
6. Remove entering and leaving chilled water temperature thermistors. Make sure to label thermistors as they are removed. Label entering water thermistor as EWT (entering water temperature) and leaving water thermistor as LWT (leaving water temperature).
7. Disconnect field-supplied water piping. The factory-installed water piping, thermistor well, and strainer can remain with the evaporator. NOTE: The strainer will be loose once disconnected from field-supplied water piping.
8. Disconnect flow switch cable from flow switch located on factory-installed leaving water piping. The flow switch can remain in the water piping.
9. Disconnect EXV (electronic expansion valve) cables from EXVs. Make sure to label the cables as they are removed.
10. Because the 30RC units use polyolester (POE) oil, which can absorb moisture, it is important to minimize the amount of time that the system interior is left exposed to the atmosphere. Minimizing the exposure time of the oil to the atmosphere will minimize the amount of moisture that needs to be removed during evacuation.
11. Cut suction, liquid, and hot gas bypass lines (if equipped) in area shown in Fig. 4. Remove evaporator as well as the filter drier, EXV, and service valve assembly from unit. It is not recommended to separate the filter drier, EXV, and service valve assembly from the evaporator. Cut the liquid line in a convenient location to allow installation of the liquid line service valve.
12. Transport the evaporator, factory-installed water piping assembly, and filter drier, EXV, and service valve assembly to the new location using the lifting holes shown in Fig. 2 and 3, and bolt it in place. Make sure the new location can support the weight of the evaporator while operating. Install evaporator vertically as shown in Fig. 4. If the filter drier, EXV, and service valve assemblies were separated from the BPHE, ensure there is enough room to install them at new location. Refer to Fig. 5 for filter drier, EXV, and service valve assembly dimensions.
13. If separated, reinstall the filter drier, EXV, and service valve assembly at the evaporator. Keep the location of the EXVs as close to the evaporator as possible but no further than 24 in. away. See Fig. 6.
14. Following Carrier recommended piping practices, install field-supplied liquid and suction lines to reconnect the evaporator with the base unit. Refer to Tables 2-3 for refrigerant pipe sizing information. As shown in Fig. 6, the pressure relief valves included in the kit must be installed on the new liquid lines between the service valves as required by local codes. Figure 7 shows double suction riser information. Pressure relief valves must be piped to the outside.
15. Prior to brazing the suction and liquid line, remove the following parts from the suction and liquid line to avoid damage:
    a. Suction pressure transducer(s) and Schrader core(s) from the fitting(s)
    b. Schrader core(s) and cap(s) from pressure tap fittings
    c. Return gas thermistor and insulation
    d. High flow Schrader port(s) and cap(s)
    e. Fusible plug(s) on suction piping and filter drier
    f. Low side and high side pressure relief valves, if equipped.

    Be sure all wires are clear of the brazing operation to avoid damage.

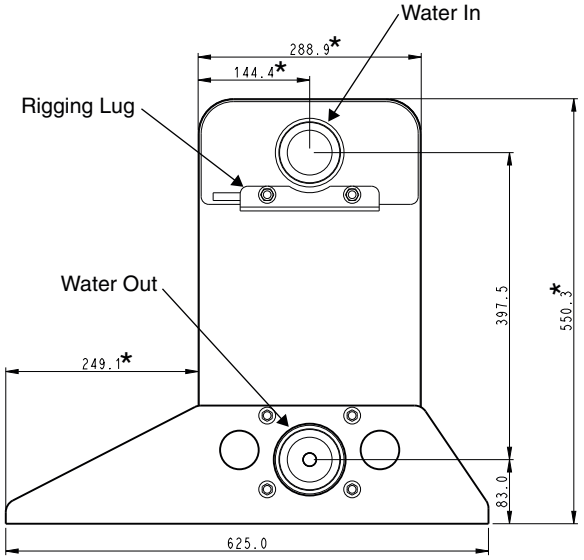
⚠ WARNING

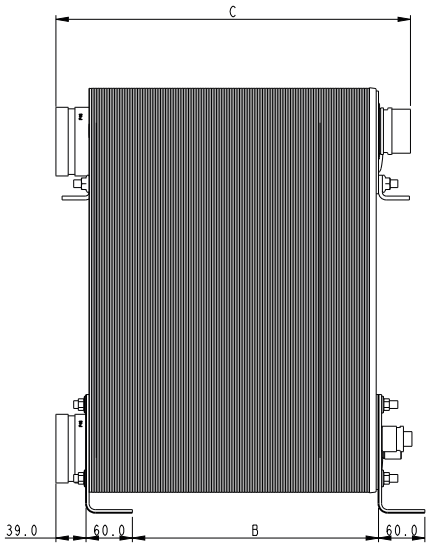
Do not shut off both service valves in either liquid line. Pressure can build within the trapped area. To avoid the possibility of personal injury or property damage, the pressure relief valves included in the kit must be installed in each liquid line between the two shutoff valves. See Fig. 6.

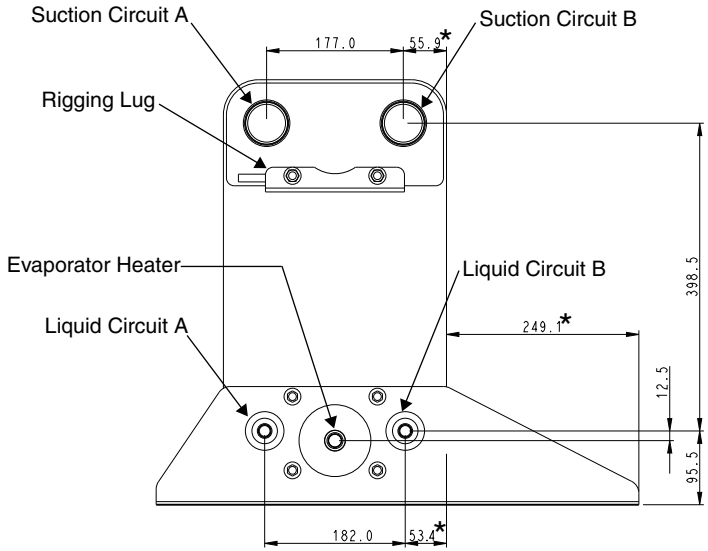
16. Record the total charge on the label 2009348539 and attach it near the outdoor condenser name plate.



* The dimensions shown are without the evaporator insulation installed.
Evaporator is shipped with factory-installed insulation that is 19.1 mm (3/4 in.) thick.
Add/subtract insulation thickness as necessary to determine actual dimensions.

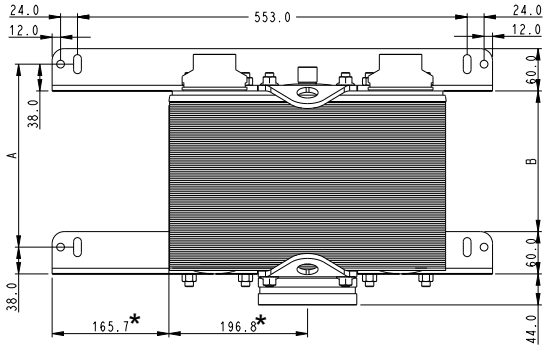






UNIT SIZE	DIMENSIONS (mm)		
	A	B	C
067	247.0	225.0	365.2
072	289.6	267.6	407.8
082-092	340.7	318.7	458.9

Fig. 2 — Evaporator Dimensions (mm) – 30RC067-092 Units



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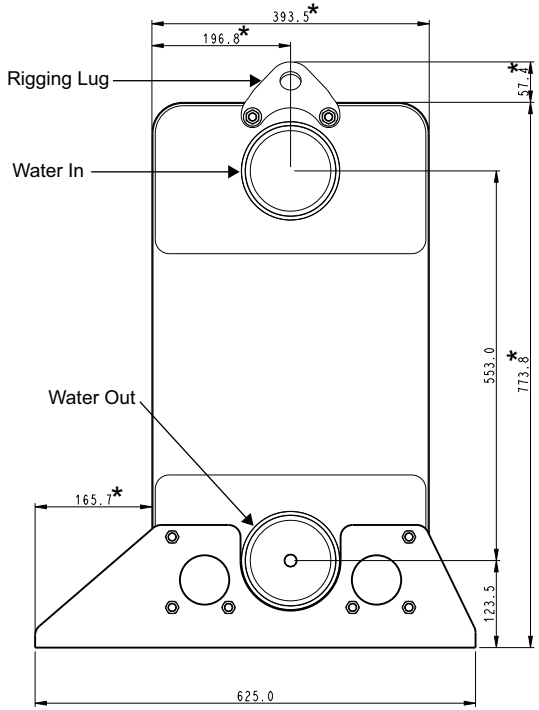
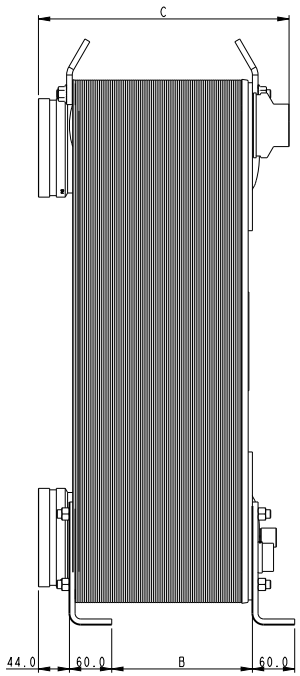
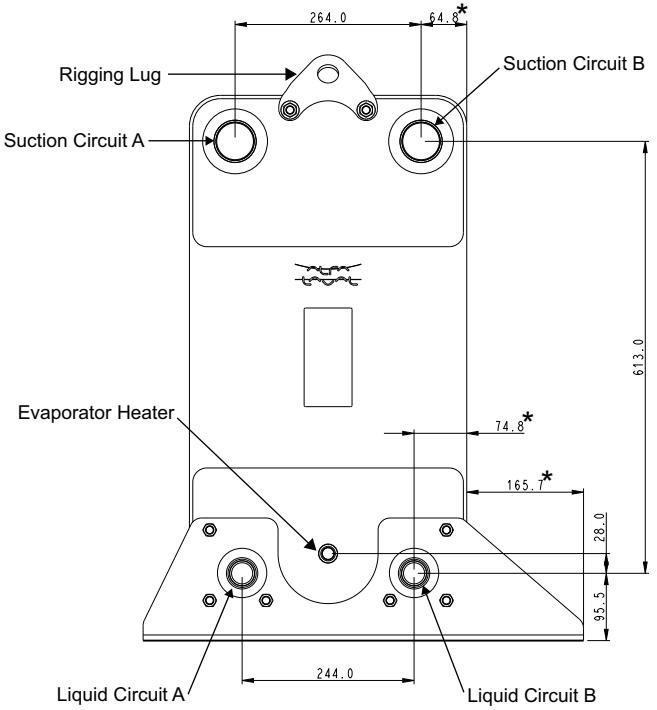
Add/subtract insulation thickness as necessary to determine actual dimensions.







UNIT SIZE	DIMENSIONS (mm)		
	A	B	C
102	221.7	199.7	355.7
112-122	295.6	273.6	429.6
132	337.8	315.8	471.8
152-162	390.6	368.6	524.6
182	432.6	410.6	566.6
202	590.6	568.6	724.6
232-252	654.6	632.6	788.6

Fig. 3 — Evaporator Dimensions (mm) – 30RC102-252 Units

Table 2 — Evaporator Connection Dimensions

UNIT 30RC	CARRIER P/N	WATER CONNECTIONS (VICTAULIC) INLET/OUTLET (in.)	REFRIGERANT CONNECTIONS LIQUID INLET (IDS) (in.)		REFRIGERANT CONNECTIONS SUCTION OUTLET (IDS) (in.)		EMPTY WEIGHT (lb)	EMPTY WEIGHT (kg)	OPERATING WEIGHT (lb)	OPERATING WEIGHT (kg)
			Ckt A	Ckt B	Ckt A	Ckt B				
067	LL01LV060	3	5/8	5/8	1-5/8	1-5/8	134.3	60.9	178.6	81.0
072	LL01LV070	3	5/8	5/8	2-1/8	2-1/8	153.6	69.7	204.3	92.7
082	LL01LV080	3	5/8	5/8	2-1/8	2-1/8	176.2	79.9	234.5	106.3
92C	LL01LV080	3	5/8	5/8	2-1/8	2-1/8	176.2	79.9	234.5	106.3
092	LL01LV080	3	5/8	5/8	2-1/8	2-1/8	176.2	79.9	234.5	106.3
102C	LL01LV100	5	1-3/8	1-3/8	2-1/8	2-1/8	242.6	110.0	330.7	150.0
102	LL01LV100	5	1-3/8	1-3/8	2-1/8	2-1/8	242.6	110.0	330.7	150.0
112	LL01LV110	5	1-3/8	1-3/8	2-5/8	2-5/8	302.9	137.4	414.8	188.1
122C	LL01LV110	5	1-3/8	1-3/8	2-5/8	2-5/8	302.9	137.4	414.8	188.1
122	LL01LV110	5	1-3/8	1-3/8	2-5/8	2-5/8	302.9	137.4	414.8	188.1
132C	LL01LV130	5	1-3/8	1-3/8	2-5/8	2-5/8	337.8	153.2	463.4	210.2
132	LL01LV130	5	1-3/8	1-3/8	2-5/8	2-5/8	337.8	153.2	463.4	210.2
152C	LL01LV150	5	1-3/8	1-3/8	2-5/8	2-5/8	381.4	173.0	524.0	237.6
152	LL01LV150	5	1-3/8	1-3/8	2-5/8	2-5/8	381.4	173.0	524.0	237.6
162C	LL01LV150	5	1-3/8	1-3/8	2-5/8	2-5/8	381.4	173.0	524.0	237.6
162	LL01LV150	5	1-3/8	1-3/8	2-5/8	2-5/8	381.4	173.0	524.0	237.6
182C	LL01LV180	5	1-3/8	1-3/8	2-5/8	2-5/8	416.2	189.2	571.6	259.8
182	LL01LV180	5	1-3/8	1-3/8	2-5/8	2-5/8	416.2	189.2	571.6	259.8
202C	LL01LV200	5	1-3/8	1-3/8	2-5/8	2-5/8	546.9	248.6	752.9	342.2
202	LL01LV200	5	1-3/8	1-3/8	2-5/8	2-5/8	546.9	248.6	752.9	342.2
232C	LL01LV230	5	1-3/8	1-3/8	2-5/8	2-5/8	599.2	272.4	825.4	375.2
232	LL01LV230	5	1-3/8	1-3/8	2-5/8	2-5/8	599.2	272.4	825.4	375.2
252C	LL01LV230	5	1-3/8	1-3/8	2-5/8	2-5/8	599.2	272.4	825.4	375.2
252	LL01LV230	5	1-3/8	1-3/8	2-5/8	2-5/8	599.2	272.4	825.4	375.2

LEGEND

IDS — Inside Diameter (Solder)

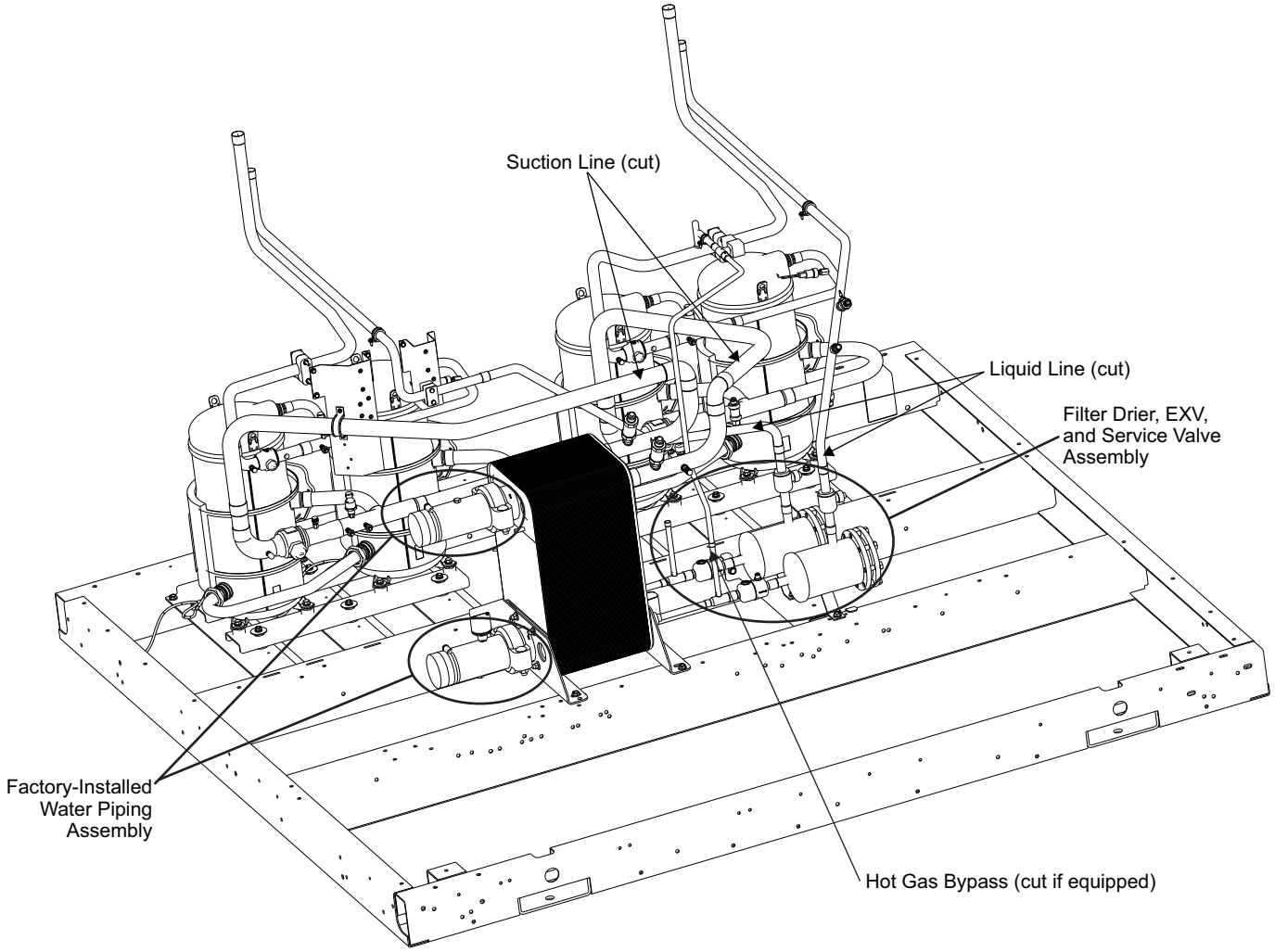


Fig. 4 — Typical Unit Evaporator Piping

UNIT SIZE	A	B	C
30RC067-30RC092	458.5	378.5	316.5
30RC102-162	474.5	404.4	332.5
30RC182-252	514.7	404.4	372.7

NOTE: Dimensions are in millimeters.

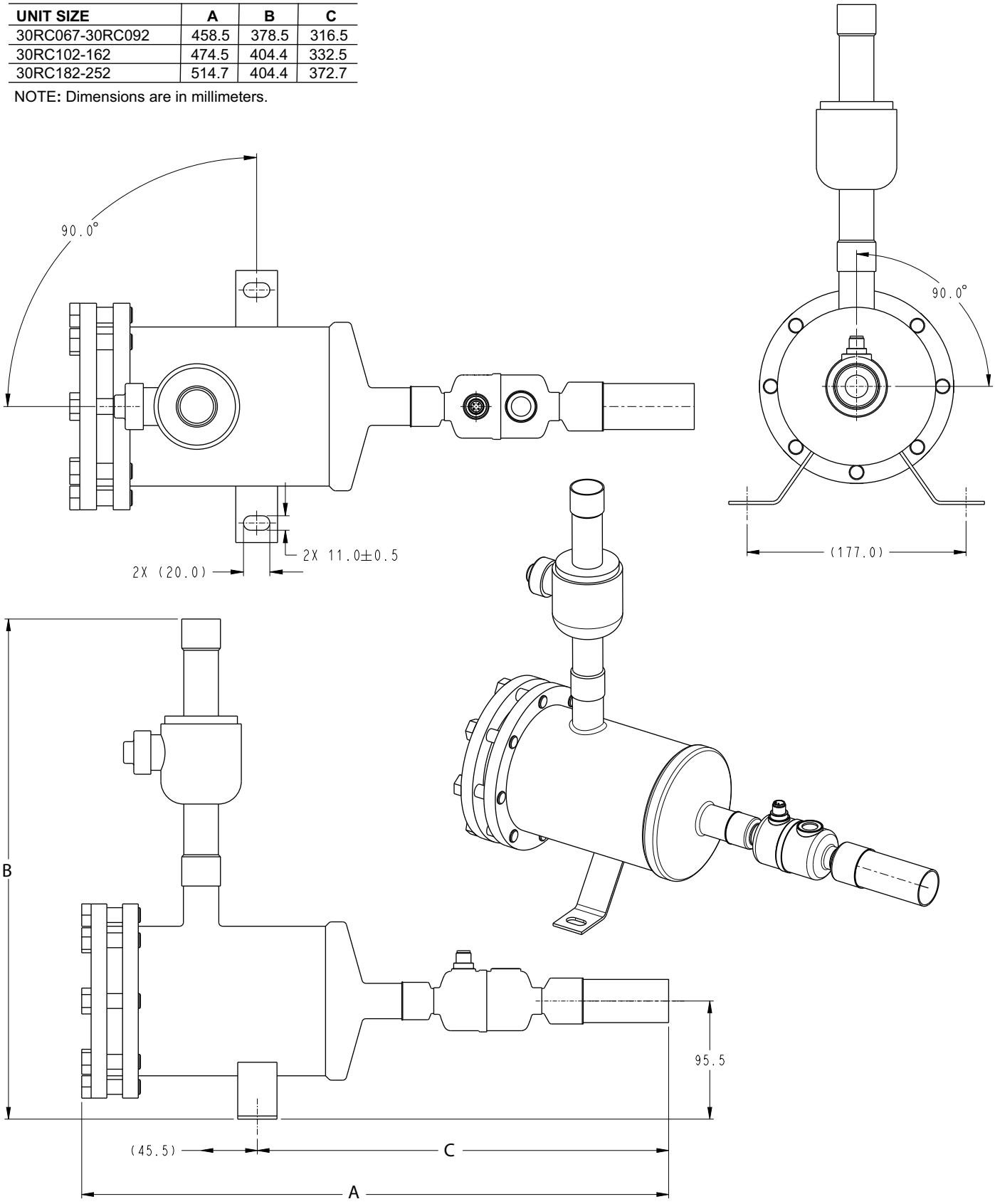
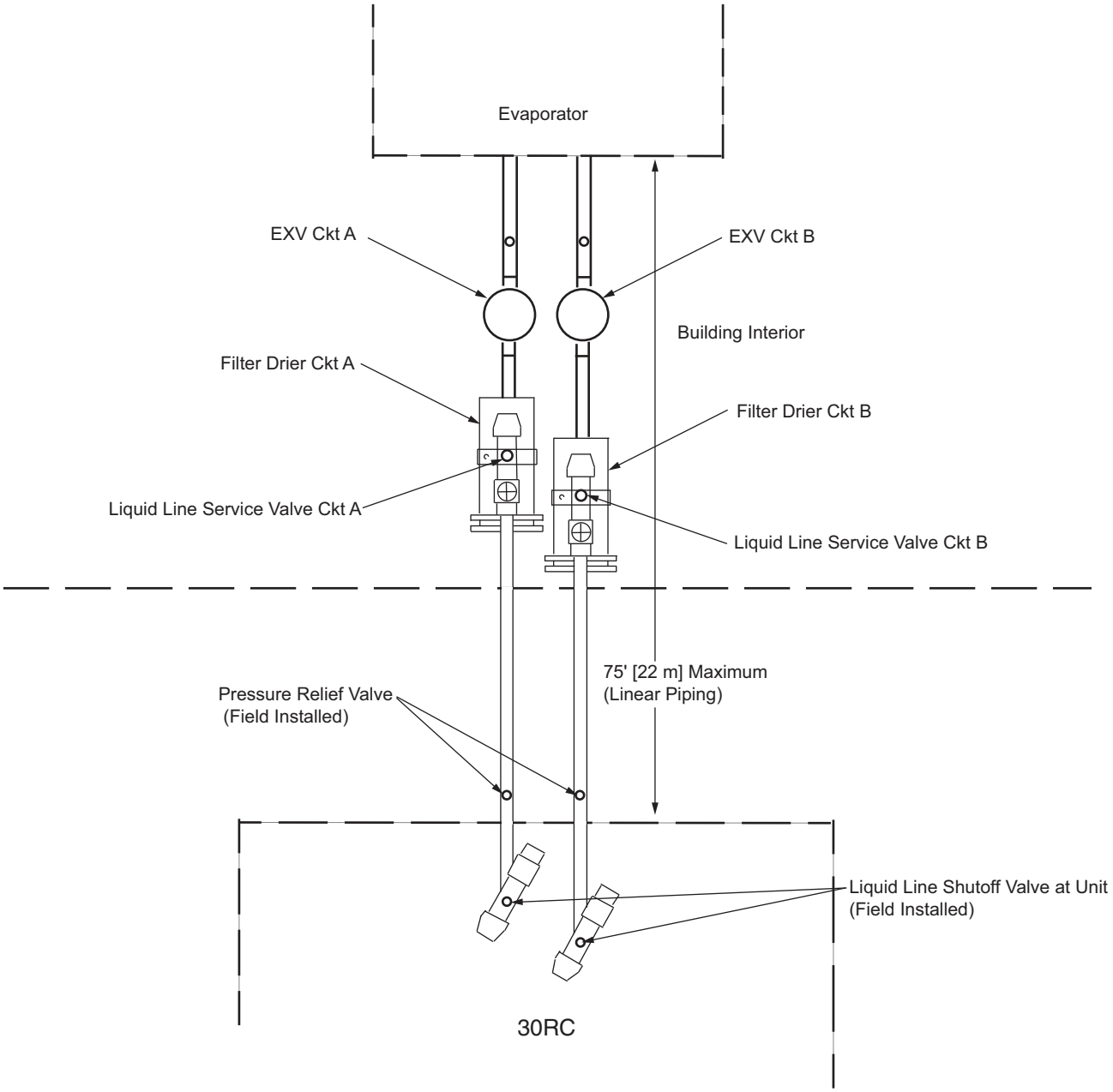


Fig. 5 — Filter Drier, EXV, and Service Valve Assembly



LEGEND

EXV — Electronic Expansion Valve

Fig. 6 — Liquid Line Piping

Table 3 — Recommended Refrigerant Line Sizing for R-32

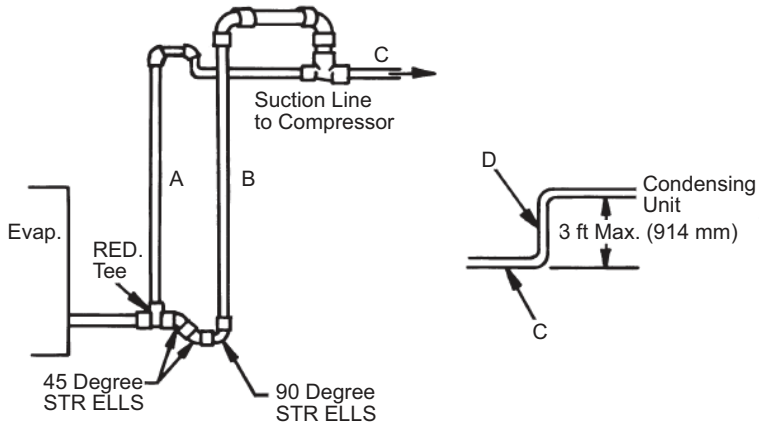
UNIT 30RC	REFRIGERANT LINES					
	SUCTION LINE DIAMETER (in.)[a]		LIQUID LINE BEFORE EXV DIAMETER (in.)		LIQUID LINE AFTER EXV DIAMETER (in.)[b]	
	Ckt A	Ckt B	Ckt A	Ckt B	Ckt A	Ckt B
067	2-1/8	2-1/8	7/8	7/8	5/8	5/8
072	2-1/8	2-1/8	7/8	7/8	5/8	5/8
082	2-1/8	2-1/8	7/8	7/8	5/8	5/8
092	2-1/8	2-1/8	7/8	1-1/8	5/8	5/8
102	2-1/8	2-1/8	1-1/8	1-1/8	1-3/8	1-3/8
112	2-5/8	2-1/8	1-1/8	1-1/8	1-3/8	1-3/8
122	2-1/8	2-5/8	1-1/8	1-1/8	1-3/8	1-3/8
132	2-5/8	2-5/8	1-1/8	1-1/8	1-3/8	1-3/8
152	2-5/8	2-5/8	1-1/8	1-1/8	1-3/8	1-3/8
162	2-5/8	2-5/8	1-1/8	1-1/8	1-3/8	1-3/8
182	2-5/8	3-1/8	1-1/8	1-3/8	1-3/8	1-3/8
202	3-1/8	3-1/8	1-3/8	1-3/8	1-3/8	1-3/8
232	3-1/8	3-1/8	1-3/8	1-3/8	1-3/8	1-3/8
252	3-1/8	3-1/8	1-3/8	1-3/8	1-3/8	1-3/8

NOTE(S):

a. Shading indicates double suction riser or reduced riser is required on circuit where suction gas flow is up (see Fig. 7 for details).
b. Removal of EXV assembly from heat exchanger is not recommended.

LEGEND

EXV — Electronic Expansion Valve



LEGEND

A — Pipe A, Suction Riser, without Trap
B — Pipe B, Suction Riser with Trap
C — Suction Line to Condensing Unit
D — Pipe D, Suction Riser Short Lift
RED — Reducer
STR — Street

NOTES:

1. Short riser, pipe D, is used when routing suction line to condensing unit connection. See table at right.

DOUBLE SUCTION RISER DIMENSIONS								
	CktA				CktB			
	A	B	C	D	A	B	C	D
112	1-5/8	2-1/8	2-5/8	2-1/8				
122					1-5/8	2-1/8	2-5/8	2-1/8
132	1-5/8	2-1/8	2-5/8	2-1/8	1-5/8	2-1/8	2-5/8	2-1/8
152	1-5/8	2-1/8	2-5/8	2-1/8				

Fig. 7 — Double Suction Riser

17. Use a nitrogen purge while brazing refrigerant lines. Be careful to route piping to proper refrigerant circuit. It is required that liquid line filter driers be installed between the condenser(s) and expansion device(s) to capture any foreign debris and provide additional moisture removal capacity.
18. If hot gas bypass valve is used in remote applications, the line size should be kept to a minimum to reduce the amount of liquid refrigerant that can condense in the line during the off cycle. Liquid refrigerant in the hot gas bypass line can result in a liquid slug entering the compressor at start-up. An OD (outside dimensions) line size of 5/8 in. is recommended for all applications. It is important to loop the hot gas bypass line over the compressor to help reduce the chance of the hot gas bypass line filling with liquid in the off cycle. The hot gas bypass valve should remain with the outdoor portion of the unit. If hot gas bypass valve is installed as a factory-installed option, cut the line outlet of the valve and run the hot gas bypass line to the remote evaporator. Leave the hot gas bypass control solenoid valve where it is already located.
19. Once all brazing is complete, re-install the devices removed in Step 15.
20. Once all of the piping connections are complete, leak test the unit and then pull a deep dehydration vacuum. Connect the

vacuum pump to the charging valve in the suction line and to the liquid line service valve. For best results, it is recommended that a vacuum of at least 500 microns be obtained. Afterwards, to ensure that no moisture is present in the system, perform a standing vacuum-rise test. With the unit in deep vacuum (500 microns or less), isolate the vacuum pump from the system. Observe the rate-of-rise of the vacuum in the system. If the vacuum rises by more than 50 microns in a 30-minute time period, then continue the dehydration process. Maintain a vacuum on the system until the standing vacuum requirement is met. This will ensure a dry system. By following these evacuation and dehydration procedures, the amount of moisture present in the system will be minimized.

21. Insulate evaporator with original insulation or suitable alternative if needed. Removal of insulation is not recommended.
22. Install new field-supplied water piping as well as reinstall the strainer in the factory-installed inlet piping.
23. Route the flow switch extension cable included in the kit from the flow switch on the factory-installed water piping to the unit. Plug the extension cable into the original flow switch cable assembly at the unit, which was previously disconnected. Coil excess cable and wire tie in a convenient location.
24. Label and cut EWT (entering water temperature) and LWT (leaving water temperature) thermistors approximately 1 ft from the SIOB-A-J25 connector. See Fig. 8.
25. The junction box supplied with the accessory is for splicing the thermistor leads from the evaporator with the 5-wire jacketed cable from the base unit. Mount the junction box near the liquid refrigerant connection end of evaporator with the M6 screws provided. One or two knockouts can be used. Remove a knockout from bottom of the junction box and install HW60EA001 conduit connector for strain relief at the knockout hole. If using conduit to provide mechanical protection to the wires between the junction box and the base unit, remove another knockout. Follow local codes.
26. Install thermistors into thermistor wells in the factory-installed entering and leaving water piping. Run the labeled thermistor leads from the evaporator into the junction box and tighten the strain relief. Strip back the lead jackets to expose the 2 wires in each lead.
27. A 100 ft (30.5 m) 5-wire jacketed cable is provided to connect the thermistor leads in the junction box back to the base unit. Each wire in the jacketed cable is a different color. Strip back the jacket of the jacketed cable on both ends to expose the 5 wires. Pick any 2 wires and label both ends of each wire "EWT." Pick another pair of wires and label both ends of each "LWT." One wire is not used.
28. Run one end of the jacketed cable(s) into the junction box and splice the cable wires to the identically tagged thermistor leads. Solder the splices and insulate them to prevent shorting. Tighten the strain relief for the cable(s) and secure the junction box cover with the supplied M6 screws. Splicing for leads is shown in Fig. 9.
29. Run the other end of the jacketed cable back to the base unit and into the control box. Tie cables to piping or run cables in conduit; follow local codes. Splice each wire in the control box to the appropriate thermistor lead. Solder the splices and insulate them to prevent short circuiting. Connect the wires to those cut from the SIOB-A-J25 plug, previously labeled EWT and LWT.
30. Label each end of one of the EXV extension cable assemblies supplied with the accessory "EXV A." Label the ends of the other assemblies "EXV B." Plug the electrical connectors of the appropriate EXV cable assemblies into the EXVs. Run the other end of the cable assemblies to the base unit. Plug the accessory EXV cable assemblies into the corresponding EXV leads located at the base unit where the EXV assemblies were removed. Coil excess cables and wire tie in a convenient location.
31. The standard 30RC units are shipped from the factory with the operating charge of a packaged system. Additional refrigerant is required for the machine to operate properly and depends upon the separation between the evaporator and the base unit, the line sizes, and the operating conditions. Table 4 provides an estimate for suction line charge and liquid line charge per 100 ft for different pipe sizes. The estimated additional refrigerant charge will be the sum of the calculated suction line charge and liquid line charge. To correct for saturated temperatures other than those shown in Table 4, multiply by the factors shown in Table 5. Actual charge should be determined at the time of start up.
32. Initially charge the machine with refrigerant using nameplate charge amount, or using Table 6 if a remote cooler special order was purchased. Add additional charge according to Step 31. Charge at the liquid line. Do not charge into suction line or compressor damage will occur. Charge the machine per the Controls, Start-Up, Operation, Service and Troubleshooting manual and adjust charge as necessary. Record the final charge amount for each circuit in Table 8.
33. Reference the Controls, Start-Up, Operation, Service and Troubleshooting manual for pre-start-up and start-up procedure. The Controls, Start-Up, Operation, Service and Troubleshooting manual also provides a procedure for adjusting oil charge, add required charge per Table 7. If, after adjusting oil charge the level remains low, check the piping system for proper design for oil return; also, check the system for leaks. If checking the oil level with unit running in part load, let unit run one hour, then run at full load for 10 minutes. If oil does not return to acceptable sight glass levels, check for correct suction piping and line sizing. Oil must be added if the oil level does not meet requirements. There are two sizes of R-32 oil cans available: 1 Liter (PP23JZ161) and 2 Liter (PP23JZ171).
34. When unit is operating correctly and the suction lines have been cleared of any leaks, install field-supplied insulation on suction lines between the unit and the evaporator.
35. Replace filter drier or filter drier core if pressure drop becomes excessive (5-8 psi) after 24 hours of operation.
36. Apply labels from installation kit to body of evaporator. Wrap the Service Port labels around the pipe near the Schrader fittings.

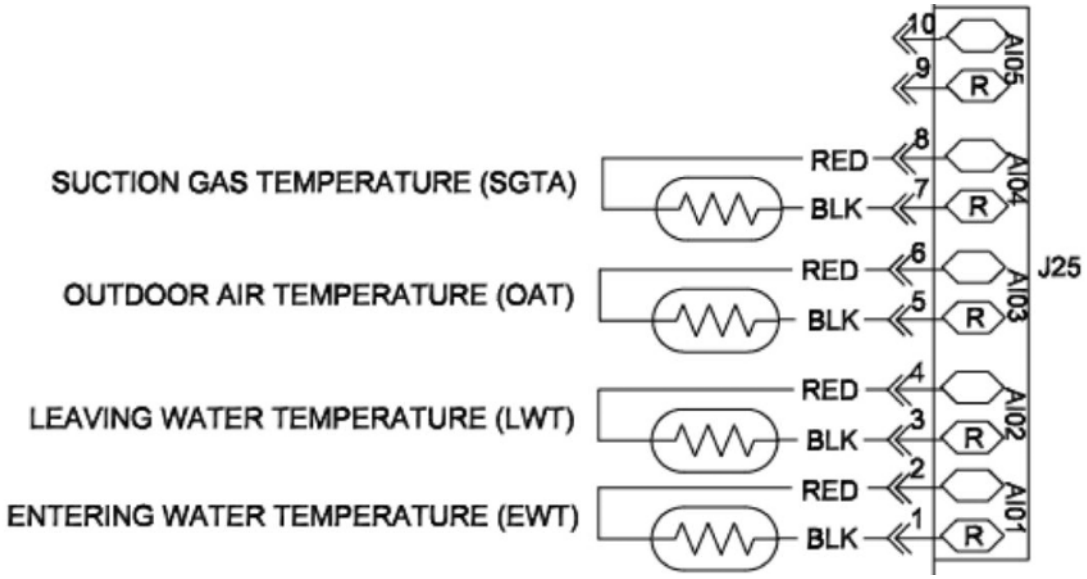


Fig. 8 — SIOB-A-J25 Connector

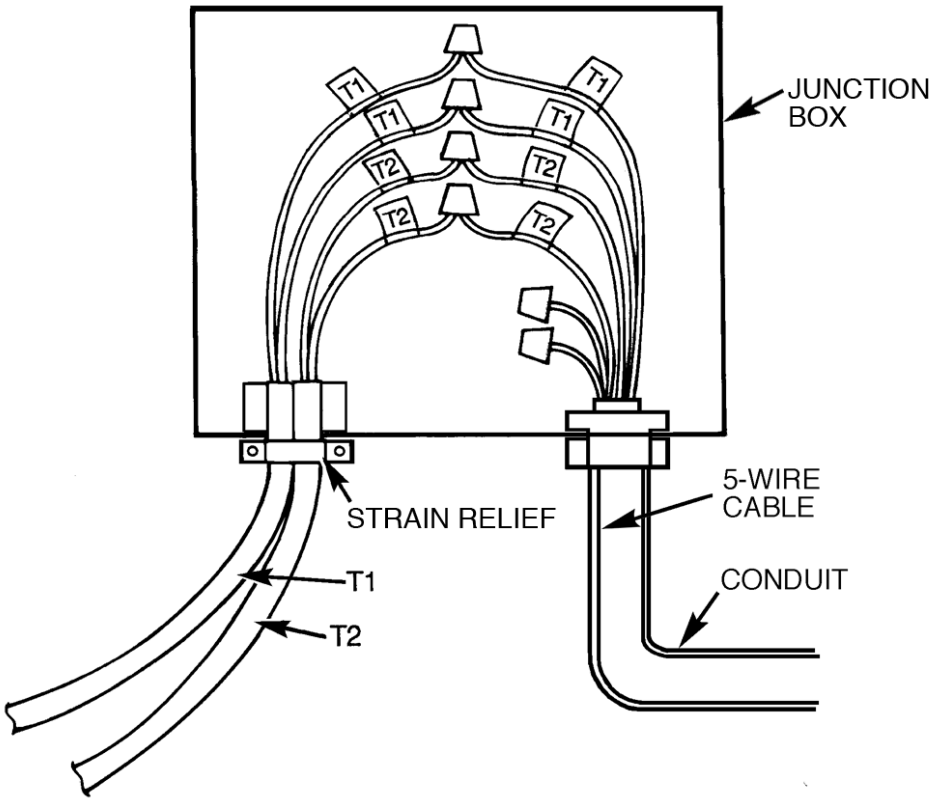


Fig. 9 — Typical Junction Box Connections

Safety Considerations for R-32 (A2L) Refrigerants

LEAK TESTING

Units are shipped with complete operating charge of refrigerant and should be under sufficient pressure to conduct a leak test. If there is no pressure in the system, then introduce enough nitrogen to search for the leak.

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

The following leak detection methods are deemed acceptable for all refrigerant systems:

1. Electronic leak detectors may be used to detect refrigerant leaks, but in the case of A2L refrigerants, the sensitivity may not be adequate or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set to the LFL (lower flammability limit) of R-32, which is 14%.
2. Leak detection fluids are also suitable for use with most refrigerants, but the use of detergents containing chlorine shall be avoided, as the chlorine may react with the refrigerant and corrode the copper pipework. Examples of leak detection fluids are the bubble method and fluorescent method agents.

If a leak is suspected, all exposed flames shall be removed/extinguished. If a leakage of refrigerant is found that requires brazing, all of the refrigerant shall be recovered from the system or isolated (by means of shut off valves) in a part of the system remote from the leak. After leaks are repaired, the system must be evacuated and dehydrated if it has not been already.

REFRIGERANT REMOVAL AND EVACUATION

When breaking into the refrigerant circuit to make repairs—or for any other purpose—conventional procedures shall be used. However, for A2L refrigerants, it is important that best practices be followed, since flammability is a consideration. The following procedure shall be adhered to:

1. Safely remove refrigerant following local and national regulations.
2. Purge the circuit with inert gas.
3. Open the circuit by cutting.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. 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 shall be 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, and 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, it has been properly maintained, and any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units, and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that FLAMMABLE REFRIGERANT does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the supplier. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

For 30RC chillers requiring R-32, the system shall be purged with oxygen-free nitrogen to render the equipment safe for A2L refrigerants. This process may need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

REFRIGERANT CHARGE

Refer to the Physical Data tables supplied in the 30RC Installation Instructions. There is a 1/4 in. Schrader connection near the lower coil connection, liquid line, for charging liquid refrigerant.

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;
- purge the circuit with inert gas (optional for A2L);
- evacuate (optional for A2L);
- continuously flush or purge with inert gas when using flame to open circuit; and
- open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, 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.

For appliances containing flammable refrigerants, refrigerants 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, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). 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.

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.

- Label the system when charging is complete (if not already).
- 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 the flammable refrigerant. If in doubt, the manufacturer should be consulted. 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.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

DECOMMISSIONING

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely.

Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

- Become familiar with the equipment and its operation.
- Isolate system electrically.
- Before attempting the procedure, ensure that:
  - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
  - all personal protective equipment is available and being used correctly;
  - the recovery process is supervised at all times by a competent person;
  - recovery equipment and cylinders conform to the appropriate standards.
- Pump down refrigerant system, if possible.
- If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- Make sure that cylinder is situated on the scales before recovery takes place.
- Start the recovery machine and operate in accordance with instructions.
- Do not overfill cylinders (no more than 80% volume liquid charge).
- Do not exceed the maximum working pressure of the cylinder, even temporarily.
- When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

LABELING

Equipment shall be labeled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

Table 4 — Estimated Additional Refrigerant Charge

R-32 WEIGHT LB (kg) OF REFRIGERANT PER 100 ft (30.48 m) OF TUBING		
NOMINAL SIZE (in.)	**SUCTION LINE 40°F (4.4°C)**	**LIQUID LINE 100°F (43.3°C)**
5/8	0.3 (0.14)	9.0 (4.1)
7/8	0.61 (0.28)	18.7 (8.5)
1-1/8	1.04 (0.47)	31.8 (14.5)
1-3/8	1.6 (0.72)	48.5 (22.0)
1-5/8	2.2 (1.02)	68.6 (31.2)
2-1/8	3.9 (1.77)	119.3 (54.2)
2-5/8	6.0 (2.73)	182.6 (83.0)
3-1/8	8.6 (3.91)	262.3 (119.2)

Table 5 — Temperature Correction Factors

R-32 CORRECTION FACTORS — ALL TEMPERATURES ARE SATURATED TEMPERATURES °F (°C)				
SUCTION LINE		**LIQUID LINE**		
40°F (4.4°C)	**40°F(4.4°C)**	**80°F(26.7°C)**	**110°F(43.3°C)**	**130°F(54.4°C)**
0.83	1.19	1.09	1.02	0.96

Table 6 — Standard 30RC Chiller Charging Table

CHILLER	STANDARD OR /COMPACT	CKTA	CKTB	CHILLER CONFIGURATION
067	S	58.0	58.6	RTPF / No Desuperheater / BPHE
	S	60.2	61.4	RTPF / No Desuperheater / DX
	S	58.9	59.2	RTPF / Desuperheater / BPHE
	S	61.0	61.9	RTPF / Desuperheater / DX
	S	23.1	23.8	MCHX / No Desuperheater / BPHE
	S	25.3	26.5	MCHX / No Desuperheater / DX
	S	24.0	24.3	MCHX / Desuperheater / BPHE
	S	26.2	27.1	MCHX / Desuperheater / DX
072	S	58.2	63.7	RTPF / No Desuperheater / BPHE
	S	60.2	66.2	RTPF / No Desuperheater / DX
	S	59.0	64.5	RTPF / Desuperheater / BPHE
	S	61.0	67.1	RTPF / Desuperheater / DX
	S	23.5	28.8	MCHX / No Desuperheater / BPHE
	S	26.0	31.4	MCHX / No Desuperheater / DX
	S	24.4	29.7	MCHX / Desuperheater / BPHE
	S	26.9	32.2	MCHX / Desuperheater / DX
082	S	63.5	63.9	RTPF / No Desuperheater / BPHE
	S	65.4	66.2	RTPF / No Desuperheater / DX
	S	64.7	64.7	RTPF / Desuperheater / BPHE
	S	66.6	67.1	RTPF / Desuperheater / DX
	S	28.6	29.0	MCHX / No Desuperheater / BPHE
	S	31.2	31.2	MCHX / No Desuperheater / DX
	S	29.9	29.9	MCHX / Desuperheater / BPHE
	S	32.4	32.1	MCHX / Desuperheater / DX
092	S	88.6	88.1	RTPF / No Desuperheater / BPHE
	S	90.5	91.6	RTPF / No Desuperheater / DX
	S	90.0	89.2	RTPF / Desuperheater / BPHE
	S	91.9	92.8	RTPF / Desuperheater / DX
	S	37.4	36.2	MCHX / No Desuperheater / BPHE
	S	38.2	39.3	MCHX / No Desuperheater / DX
	S	38.8	37.4	MCHX / Desuperheater / BPHE
	S	39.6	40.5	MCHX / Desuperheater / DX
	C	63.5	63.7	Cmpt / RTPF / No Desuperheater / BPHE
	C	28.5	28.7	Cmpt / MCHX / No Desuperheater / BPHE
102	S	89.4	88.4	RTPF / No Desuperheater / BPHE
	S	91.1	91.8	RTPF / No Desuperheater / DX
	S	90.8	89.6	RTPF / Desuperheater / BPHE
	S	92.4	92.9	RTPF / Desuperheater / DX
	S	37.1	36.1	MCHX / No Desuperheater / BPHE
	S	38.8	39.5	MCHX / No Desuperheater / DX
	S	38.5	37.3	MCHX / Desuperheater / BPHE
	S	40.1	40.6	MCHX / Desuperheater / DX
	C	64.0	64.1	Cmpt / RTPF / No Desuperheater / BPHE
	C	29.0	29.1	Cmpt / MCHX / No Desuperheater / BPHE
112	S	95.6	89.0	RTPF / No Desuperheater / BPHE
	S	97.9	93.0	RTPF / No Desuperheater / DX
	S	97.0	90.1	RTPF / Desuperheater / BPHE
	S	99.3	94.1	RTPF / Desuperheater / DX
	S	43.3	36.7	MCHX / No Desuperheater / BPHE
	S	46.3	41.0	MCHX / No Desuperheater / DX
	S	44.7	37.8	MCHX / Desuperheater / BPHE
	S	47.7	42.2	MCHX / Desuperheater / DX
122	S	90.2	118.9	RTPF / No Desuperheater / BPHE
	S	92.3	122.9	RTPF / No Desuperheater / DX
	S	92.8	120.3	RTPF / Desuperheater / BPHE
	S	94.9	124.3	RTPF / Desuperheater / DX
	S	37.9	49.2	MCHX / No Desuperheater / BPHE
	S	40.0	53.2	MCHX / No Desuperheater / DX
	S	40.5	50.5	MCHX / Desuperheater / BPHE
	S	42.6	54.6	MCHX / Desuperheater / DX
	C	66.1	117.9	Cmpt / RTPF / No Desuperheater / BPHE
	C	31.0	47.9	Cmpt / MCHX / No Desuperheater / BPHE
132	S	118.6	118.6	RTPF / No Desuperheater / BPHE
	S	120.7	122.9	RTPF / No Desuperheater / DX
	S	121.2	120.0	RTPF / Desuperheater / BPHE
	S	123.3	124.3	RTPF / Desuperheater / DX
	S	48.6	48.6	MCHX / No Desuperheater / BPHE
	S	51.0	53.2	MCHX / No Desuperheater / DX
	S	51.2	50.0	MCHX / Desuperheater / BPHE
	S	53.5	53.5	MCHX / Desuperheater / DX
	C	95.9	95.3	Cmpt / RTPF / No Desuperheater / BPHE
	C	43.3	42.8	Cmpt / MCHX / No Desuperheater / BPHE

Table 6 — Standard 30RC Chiller Charging Table (cont)

CHILLER	STANDARD OR /COMPACT	CKTA	CKTB	CHILLER CONFIGURATION
152	S	119.2	114.4	RTPF / No Desuperheater / BPHE
	S	123.8	121.0	RTPF / No Desuperheater / DX
	S	121.8	115.9	RTPF / Desuperheater / BPHE
	S	126.4	122.4	RTPF / Desuperheater / DX
	S	49.0	43.8	MCHX / No Desuperheater / BPHE
	S	54.1	51.2	MCHX / No Desuperheater / DX
	S	51.6	45.2	MCHX / Desuperheater / BPHE
	S	56.7	52.7	MCHX / Desuperheater / DX
	C	96.1	90.3	Cmpt / RTPF / No Desuperheater / BPHE
	C	43.5	17.7	Cmpt / MCHX / No Desuperheater / BPHE
162	S	140.4	138.1	RTPF / No Desuperheater / BPHE
	S	142.8	145.2	RTPF / No Desuperheater / DX
	S	143.0	139.1	RTPF / Desuperheater / BPHE
	S	145.3	146.3	RTPF / Desuperheater / DX
	S	53.3	50.9	MCHX / No Desuperheater / BPHE
	S	55.6	58.1	MCHX / No Desuperheater / DX
	S	55.8	51.9	MCHX / Desuperheater / BPHE
	S	58.2	59.1	MCHX / Desuperheater / DX
	C	114.0	114.4	Cmpt / RTPF / No Desuperheater / BPHE
	C	43.9	44.3	Cmpt / MCHX / No Desuperheater / BPHE
182	S	165.1	167.6	RTPF / No Desuperheater / BPHE
	S	165.7	175.7	RTPF / No Desuperheater / DX
	S	167.7	169.2	RTPF / Desuperheater / BPHE
	S	168.3	177.4	RTPF / Desuperheater / DX
	S	60.5	63.0	MCHX / No Desuperheater / BPHE
	S	61.1	71.1	MCHX / No Desuperheater / DX
	S	63.0	64.6	MCHX / Desuperheater / BPHE
	S	63.7	72.8	MCHX / Desuperheater / DX
	C	115.8	168.1	Cmpt / RTPF / No Desuperheater / BPHE
	C	45.7	63.0	Cmpt / MCHX / No Desuperheater / BPHE
202	S	166.2	168.6	RTPF / No Desuperheater / BPHE
	S	169.2	179.3	RTPF / No Desuperheater / DX
	S	168.8	170.3	RTPF / Desuperheater / BPHE
	S	171.7	180.9	RTPF / Desuperheater / DX
	S	61.6	64.0	MCHX / No Desuperheater / BPHE
	S	64.5	74.7	MCHX / No Desuperheater / DX
	S	64.2	65.7	MCHX / Desuperheater / BPHE
	S	67.1	76.3	MCHX / Desuperheater / DX
	C	116.7	169.0	Cmpt / RTPF / No Desuperheater / BPHE
	C	46.6	63.9	Cmpt / MCHX / No Desuperheater / BPHE
232	S	197.4	194.3	RTPF / No Desuperheater / BPHE
	S	200.3	203.7	RTPF / No Desuperheater / DX
	S	202.2	195.9	RTPF / Desuperheater / BPHE
	S	205.1	205.3	RTPF / Desuperheater / DX
	S	73.7	70.6	MCHX / No Desuperheater / BPHE
	S	78.2	81.6	MCHX / No Desuperheater / DX
	S	78.5	72.2	MCHX / Desuperheater / BPHE
	S	83.0	83.3	MCHX / Desuperheater / DX
	C	173.3	169.1	Cmpt / RTPF / No Desuperheater / BPHE
	C	68.0	64.0	Cmpt / MCHX / No Desuperheater / BPHE
252	S	197.4	194.3	RTPF / No Desuperheater / BPHE
	S	200.3	203.7	RTPF / No Desuperheater / DX
	S	202.2	195.9	RTPF / Desuperheater / BPHE
	S	205.1	205.3	RTPF / Desuperheater / DX
	S	73.7	70.6	MCHX / No Desuperheater / BPHE
	S	78.2	81.6	MCHX / No Desuperheater / DX
	S	78.5	72.2	MCHX / Desuperheater / BPHE
	S	83.0	83.3	MCHX / Desuperheater / DX
	C	173.3	169.1	Cmpt / RTPF / No Desuperheater / BPHE
	C	68.0	64.0	Cmpt / MCHX / No Desuperheater / BPHE

Table 7 — 100 Ft Refrigerant Line Oil Adder

LIQUID LINE	LITER
5/8	0.13
7/8	0.27
1-1/8	0.36
1-3/8	0.70
1-5/8	0.99
2-1.8	1.72
2-5/8	2.63
3-1/8	3.76

SUCTION LINE	LITER
5/8	0.17
7/8	0.35
1-1/8	0.60
1-3/8	0.91
1-5/8	1.38
2-1/8	1.95
2-5/8	3,31
3-1/8	4.73

Table 8 — Total Refrigerant Charge and Oil Adder Field Log

TOTAL REFRIGERANT CHARGE		lbs
TOTAL OIL ADDER		liters